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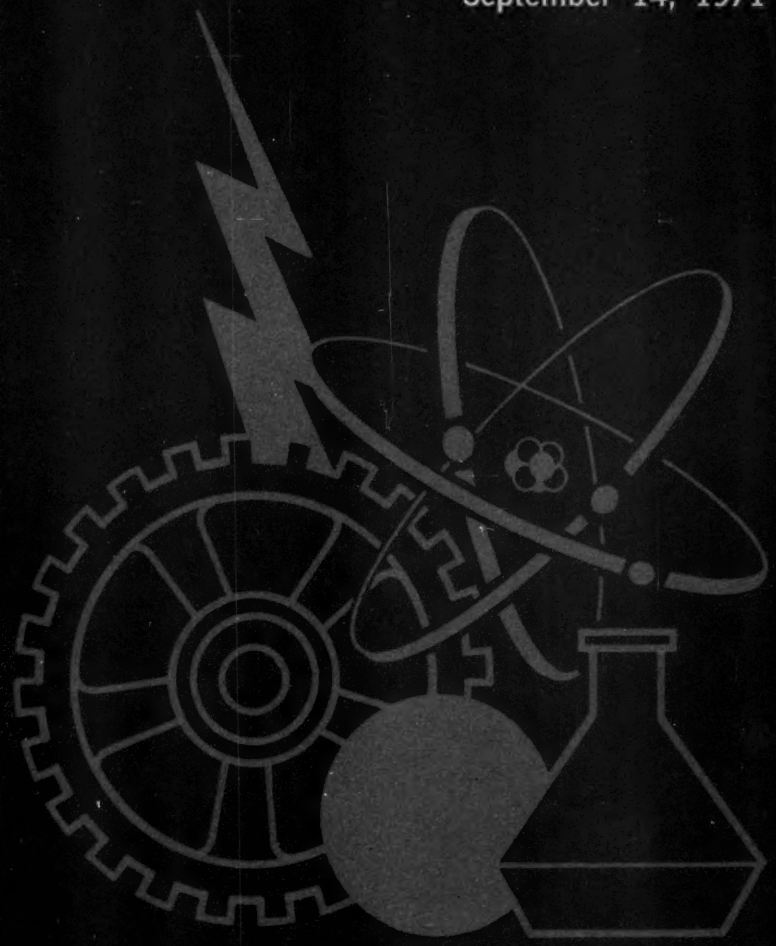

U. S. DEPARTMENT OF COMMERCE

Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

September 14, 1971 Volume 890 Number 2

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PATENT OFFICE NOTICES

TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

Chapter 1—Patent Office, Department of Commerce

PART 1—RULES OF PRACTICE IN PATENT CASES

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Recognition of Attorneys and Agents, Standards of Conduct, and Patent Aplication Petitions

These rule changes eliminate present provision for the recognition and registration of firms of attorneys and agents for practice in patent and trademark cases, and permit registered attorneys and agents to file papers in patent applications without the need for filing powers of attorney or authorizations. The changes further establish the Code of Professional Responsibility of the American Bar Association as the standard of conduct for those practicing before the Patent Office insofar as the Code is not inconsistent with Patent Office rules. Other changes eliminate the present requirement for a petition or other express request for a patent and liberalize requirements as to inventor names.

The changes relating to the discontinuance of the recognition and registration of firms are intended to obviate problems incident to such registration such as, for example, the lack of certainty as to the responsibility of individual attorneys and agents for actions taken by registered nonpartnership business entities, such as professional corporations, the problems associated with the rights to firm names and registration numbers upon dissolution or reorganization of firms, and the recognition as "firms" of groups of attorneys or agents, such as parts of corporation organizations, when the attorneys and agents are not in fact associated as partners. Acceptance of papers filed in patent applications by registered attorneys and agents upon a representation that the attorney or agent is authorized to act in a representative capacity is for the purpose of facilitating responses on behalf of applicants in patent applications, and, further, to obviate the need for filing powers of attorney or authorizations of agent in individual applications when there has been a change in composition of law firms or corporate patent staffs. Interviews with a registered attorney or agent not of record will, in view of 35 U.S.C. section 122, be conducted only on the basis of information and files supplied by the attorney or agent.

Provision is made for an applicant to supply an address to receive correspondence from the Patent Office concerning his application, in addition to his residence address, so that the Patent Office may direct mail to any address of applicant's selection, such as a corporate patent department, a firm of attorneys or agents, or an individual attorney, agent, or other person. In connection with patent applications pending upon the effective date of the changes in which a firm is the only representative of record (and in connection with divisions and continuations thereof not requiring execution by the applicant), the address of the firm will be considered to be the correspondence address for the application. Powers of attorney and authorizations of agent in favor of registered individual attorneys and agents will, of course, continue to be recognized and accepted.

The amendments to §§ 1.344 and 2.13 are intended to provide a more definite and uniform standard of conduct for those engaged in practice before the Patent Office than do present rules. The Code of Professional Responsibility of the American Bar Association is incorporated by reference in the rule with a statement as to where copies thereof may be inspected or obtained. The rule specifies that the standards referred to are those set forth in the Code of Professional Responsibility as amended February 24, 1970, and the rule does not, therefore, refer to standards imposed by later amendments of the Code. Any standards in other Patent Office rules which are inconsistent with standards imposed by the Code (as, for example, the limitations in § 1.345(b) on the distribution of professional announcements and the duties imposed by § 1.205(b)) remain in force.

The elimination of the requirement for a petition requesting the grant of a patent and the relaxation of requirements as to the names of applicants are intended to simplify patent application procedures. Section 1.76 is being revoked as redundant in view of revisions in § 1.57.

Notice of proposed rule making regarding revocation of §§ 1.35 and 1.61 and revision of §§ 1.14, 1.21, 1.33, 1.34, 1.36, 1.51, 1.52, 1.57, 1.76, 1.341, 1.343, 1.344, 1.346, 1.347, 2.13, and 2.15 of Title 37, Code of Federal Regulations was published in the Federal Register of January 15, 1971 (36 F.R. 611). Interested persons were given an opportunity to participate in the rulemaking process through submission of comments in writing and at an oral hearing held on March 23, 1971. The rules are being adopted after full and careful consideration of all the material submitted. The departures from the published text reflect certain of the views expressed in the submitted material.

Effective date. This revision shall become effective on the date of its publication in the Federal Register (7–2–71).

In consideration of the comments received and pursuant to the authority contained in Section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6), and Section 31 of that Act (66 Stat. 795; 35 U.S.C. 31), Title 37 of the Code of Federal Regulations is hereby amended as follows:

1. In § 1.14, paragraph (a) is revised to read as follows:

§ 1.14 *Patent applications preserved in secrecy.*

(a) Except as provided in § 1.11(b) pending patent applications are preserved in secrecy. No information will be given by the Office respecting the filing by any particular person of an application for a patent, the pendency of any particular case before it, or the subject matter of any particular application, nor will access be given to or copies furnished of any pending application or papers relating thereto, without written authority in that particular application from the applicant or his assignee or attorney or agent of record, unless it shall be necessary to the proper conduct of business before the Office or as provided by this part.

* * * * *

2. In § 1.21, paragraph (h) is revised to read as follows:

§ 1.21 *Patent and miscellaneous fees and charges.*

* * * * *

(h) For registration of an attorney or agent:

For admission to examination for registration to practice, fee payable upon application	$35.00
On registration to practice	25.00

* * * * *

3. Section 1.33 is revised to read as follows:

§ 1.33 *Correspondence respecting patent applications and proceedings.*

(a) The residence and post office address of the applicant must appear in the oath or declaration if not stated elsewhere in the application. The applicant may also specify and an attorney or agent of record may specify a correspondence address to which communications about the application are to be directed. All notices, official letters, and other communications in the case will be directed to the correspondence address or, if no such correspondence address is specified, to an attorney or agent of record (see § 1.34(b)), or, if no attorney or agent is of record, to the applicant, or to any assignee of record of the entire interest if the applicant or such assignee so requests, or to an assignee of an undivided part if the applicant so requests, at the post office address of which the Office has been notified in the case. Amendments and other papers filed in the application must be signed: (1) By the applicant, or (2) if there is an assignee of record of an undivided part interest, by the applicant and such assignee, or (3) if there is an assignee of record of the entire interest, by such assignee, or (4) by an attorney or agent of record, or (5) by a registered attorney or agent not of record who acts in a representative capacity under the provisions of § 1.34(a). Double correspondence with an applicant and his attorney or agent, or with more than one attorney or agent, will not be undertaken. If more than one attorney or agent be made of record and a correspondence address has not been specified, correspondence will be held with the one last made of record.

(b) An applicant who has not made of record a registered attorney or agent may be required to state whether he received assistance in the preparation or prosecution of his application, for which any compensation or consideration was given or charged, and if so, to disclose the name or names of the person or persons providing such assistance. This includes the preparation for the applicant of the specification and amendments or other papers to be filed in the Patent Office, as well as other assistance in such matters, but does not include merely making drawings by draftsmen or stenographic services in typing papers.

4. Section 1.34 is revised to read as follows:

§ 1.34 *Recognition for representation.*

(a) When a registered attorney or agent acting in a representative capacity appears in person or signs a paper in practice before the Patent Office in a patent case, his personal appearance or signature shall constitute a representation to the Patent Office that, under the provisions of this part and the law, he is authorized to represent the particular party in whose behalf he acts. In filing such a paper, the attorney or agent should specify his registration number with his signature. Further proof of authority to act in a representative capacity may be required.

(b) When an attorney or agent shall have filed his power of attorney, or authorization, duly executed by the person or persons entitled to prosecute the application, he is a principal attorney of record in the case. A principal attorney or agent so appointed, may appoint an associate attorney or agent who shall also then be of record.

§ 1.35 [*Revoked*]

5. Section 1.35 is revoked.

6. Section 1.36 is revised to read as follows:

§ 1.36 *Revocation of power of attorney or authorization; withdrawal of attorney or agent.*

A power of attorney or authorization of agent may be revoked at any stage in the proceedings of a case, and an attorney or agent may withdraw, upon application to and approval by the Commissioner. An attorney or agent, except an associate attorney or agent whose address is the same as that of the principal attorney or agent, will be notified of the revocation of his power of attorney or authorization, and the applicant will be notified of the withdrawal of the attorney or agent. An assignment will not of itself operate as a revocation of a power or authorization previously given, but the assignee of the entire interest may revoke previous powers and be represented by an attorney or agent of his own selection.

7. Section 1.51 is revised to read as follows:

§ 1.51 *General requisites of an application.*

Applications for patents must be made to the Commissioner of Patents. A complete application comprises:

(a) A specification, including a claim or claims, see §§ 1.71 to 1.77.

(b) An oath or declaration, see §§ 1.65 and 1.68.

(c) Drawings, when necessary, see §§ 1.81 to 1.88.

(d) The prescribed filing fee. (See 35 U.S.C. section 41 for filing fees.)

8. In § 1.52, paragraph (a) is revised to read as follows:

§ 1.52 *Language, paper, writing, margins.*

(a) The specification and oath or declaration must be in the English language. All papers which are to become a part of the permanent records of the Patent Office must be legibly written or printed in permanent ink.

* * * * *

9. Section 1.57 is revised to read as follows:

§ 1.57 *Signature.*

The application must be signed by the applicant in person. The signature to the oath or declaration will be accepted as the signature to the application provided the oath or declaration is attached to and refers to the specification and claims to which it applies. Otherwise the signature must appear at the end of the specification after the claims. Full names must be given, including at least one given name without abbreviation together with any other given name or initial.

§ 1.61 [*Revoked*]

10. Section 1.61 is revoked.

§ 1.76 [*Revoked*]

11. Section 1.76 is revoked.

12. In § 1.77, paragraph (h) is revised to read as follows:

§ 1.77 *Arrangement of application.*

* * * * *

(h) Signature. (See § 1.57.)

§ 1.341 [*Amended*]

13. Section 1.341 is amended by revoking paragraph (d).

14. Section 1.343 is revised to read as follows:

§ 1.343 *Persons not registered or recognized.*

Only persons who are registered or given limited recognition as provided in § 1.342 will be permitted to prosecute patent applications of others before the Patent Office.

15. Section 1.344 is revised to read as follows:

§ 1.344 *Professional conduct.*

Attorneys and agents appearing before the Patent Office must conform to the standards of ethical and professional conduct set forth in the Code of Professional Responsibility of the American Bar Association as amended February 24, 1970, insofar as such code is not inconsistent with this part. A copy of the said code is available for inspection in the Office of the Solicitor, U.S. Patent Office, Room 11C04, Building 3, Crystal Plaza, 2021 Jefferson Davis Highway, Arlington, Va. Copies of the code are available upon request to the American Bar Center, 1155 E. 60th Street, Chicago, Ill. 60637.

16. Section 1.346 is revised to read as follows:

§ 1.346 *Signature and certificate of attorney.*

Every paper filed by an attorney or agent representing an applicant or party to a proceeding in the Patent Office must bear the signature of such attorney or agent, except papers which are required to be signed by the applicant or party in person (such as the application itself and affidavits or declarations required of applicants). The signature of an attorney or agent to a paper filed by him, or the filing or presentation of any paper by him, constitutes a certificate that the paper has been read; that its filing is authorized; that to the best of his knowledge, information, and belief, there is good ground to support it; and that it is not interposed for delay.

17. Section 1.347 is revised to read as follows:

§ 1.347 *Removing names from registers.*

Attorneys and agents, registered to practice before the Patent Office, should notify the Office of any change of address for entry on the register, by letter separate from any notice of change of address filed in individual applications. The Office may address a letter to any person on the registers, at the address of which separate notice for the register was last received, for the purpose of ascertaining whether such person desires to remain on the register. The name of any person failing to reply and give the information requested within a time limit specified will be removed from the register, and the names so removed published in the OFFICIAL GAZETTE. Any name so removed may be reinstated, either on the register of attorneys or the register of agents, as may be appropriate.

18. Section 2.13 is revised to read as follows:

§ 2.13 *Professional conduct.*

Attorneys and other persons appearing before the Patent Office in trademark cases must conform to the standards of ethical and professional conduct set forth in the Code of Professional Responsibility of the American Bar Association as amended February 24, 1970, insofar as such code is not inconsistent with this part. A copy of the said code is available for inspection in the Office of the Solicitor, U.S. Patent Office, Room 11C04, Building 3, Crystal Plaza, 2021 Jefferson Davis Highway, Arlington, Va. Copies of the code are available upon request to the American Bar Center, 1155 East 60th Street, Chicago, Ill. 60637.

19. Section 2.15 is revised to read as follows:

§ 2.15 *Signature and certificate of attorney or agent.*

Every paper filed by an attorney at law or other person representing an applicant or party to a proceeding in the Patent Office must bear the signature of such attorney at law or other person except those papers which are required to be signed by the applicant or party. The signature of an attorney at law or such other person to a paper filed by him,

or the filing of any paper by him, constitutes a certificate that the paper has been read; that its filing is authorized; that to the best of his knowledge, information, and belief there is good ground to support it; and that it is not interposed for delay.

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Approved:

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

[FR Doc. 71-9387; Filed 7-1-71; 8:49 am]

Published in 36 F.R. 12616, July 2, 1971

Establishment of Manual of Trademark Examining Procedure

Preliminary work has begun on the preparation of a Manual of Trademark Examining Procedure.

Directives on trademark examining procedure will be issued by the Patent Office from time to time and, when appropriate, will be included in the Manual at a later date. The directives will be numbered sequentially and those issued prior to publication of the Manual will be designated as Series 1. These directives will constitute the guidelines for the examination of trademark applications.

Trademark Examining Directives are available through the Superintendent of Documents, Washington, D.C., 20013 at an annual subscription of $1.50 plus 50¢ for foreign mailing.

ROBERT GOTTSCHALK,
July 27, 1971. *Acting Commissioner of Patents.*

Printing of Chemical Patents

In view of financial and scheduling considerations associated with the closing of Fiscal Year 1971, no chemical patents will appear in the patent issues of August 24 and 31, and September 7 and 14, 1971. Chemical patents will again be issued on September 21, 1971.

RICHARD A. WAHL,
July 6, 1971. *Acting Commissioner of Patents.*

Re: Trademarks

[37 CFR Part 2]

ACCESS TO PENDING APPLICATIONS

Notice of Proposed Rule Making

Notice is hereby given that pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) the Patent Office proposes to revise § 2.27 of Title 37, Code of Federal Regulations as set forth below.

All persons are invited to present their written views, objections, recommendations, or suggestions in connection with the proposed changes to the Commissioner of Patents, Washington, D.C. 20231 on or before October 15, 1971. No oral hearing will be held.

The only substantive change made in § 2.27 is elimination of the requirement to show good cause for access to pending applications. The amendment is intended to liberalize access to pending trademark applications. A written request for access will continue to be required, however, so that a record of those persons having access to pending applications may be maintained. The proposed amendment also restructures the form of the rule by dividing it into four sections for easier reading.

The text of the proposed revised section is as follows:

§ 2.27 *Pending application index; access to applications.*

(a) An index of pending applications including the name and address of the applicant, a reproduction or description of the mark, the goods or services with which the mark is used, the class number, the dates of use, and the serial number and filing date of the application will be available for public inspection as soon as practicable after filing.

(b) Access to the file of a particular pending trademark application will be permitted prior to publication under § 2.81 upon written request.

(c) Decisions of the Commissioner and the Trademark Trial and Appeal Board in applications and proceedings relating thereto are published or available for inspection or publication.

(d) After a mark has been registered, or published for opposition, the file of the application and all proceedings relating thereto are available for public inspection and copies of the papers may be furnished upon paying the fee therefor.

ROBERT GOTTSCHALK,
Acting Commissioner of Patents.

Approved: August 9, 1971.

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

[FR Doc. 71-12161; Filed 8-19-71; 8:45 am]

Published in 36 F.R. 16194; Aug. 20, 1971

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,600,236, S. J. Gibel, MUFFLER WITH A PLURALITY OF PASSAGES; **3,380,553,** same, EXHAUST MUFFLER WITH EXPANSION CHAMBERS IN INLET COVER DOME, **filed** Mar. 24, 1971, D.C., N.D. Ohio (Cleveland), Doc. 71-C-281, *Allied Witan Company* v. *Fabco-Air, Inc.*

2,611,813, Sharpless and Eichert, Jr., MAGNETIC DATA STORAGE SYSTEM, **filed** Apr. 10, 1964, Ct. of Cl., Washington, D.C., Doc. 99-64, *Technitrol, Inc.* v. *The United States.* Four claims (5, 16, 19 and 23) held representative. Defendant fully licensed under claim 16. Defendant licensed under all other claims except to the extent such claims are validly limited to the automatic reset feature. Case remanded to the trial commissioner to determine if claims represented by claims 5, 19 and 23 enforce the reset feature and if so whether patent is valid. If answers are affirmative then issue of infringement to be determined.

2,647,590, C. A. Anderson, Jr., HYDRAULIC ELEVATOR, **filed** May 13, 1968, D.C., N.D. Ill. (Chicago), Doc. 68c865, *Advanced Hydraulics, Inc.* v. *Clark Equipment Company.* Claims 1 to 8 of patent are not infringed by defendants. Validity of patent is not in issue because patent expired Aug. 4, 1970, Apr. 26, 1971.

2,693,498, H. L. Penberthy, ELECTRODE ASSEMBLY FOR GLASS FURNACES, **filed** May 10, 1971, D.C., W.D. Wash. (Seattle), Doc. 9680, *Harvey L. Penberthy, Penberthy Electromelt, Inc.* v. *Chester K. Rhett, C. Rhett, Inc.*

2,703,277, Spendelow, Jr. and Crafts, NICEL-BASE ALLOY FOR HIGH TEMPERATURE SERVICE, **filed** May 5, 1971, D.C. Mass. (Boston), Doc. 71-980-J, *Cabot Corporation* v. *Cyclops Corporation.*

2,704,346, E. J. Schaefer, MOTOR CONTROL FOR SUBMERSIBLE SUMP PUMP, **filed** Apr. 6, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c849, *Franklin Electric Co.* v. *Universal Electric Supply Co., Universal Electric Co.*

2,707,985, F. C. Binnall, BAG MAKING MACHINE; **2,740,740,** same, METHOD OF MAKING BAGS, **filed** Apr. 28, 1971, D.C. Conn. (New Haven), Doc. 14372, *FMC Corporation* v. *Fischel Industries, Inc.*

2,740,740. (See 2,707,985.)

2,765,699, J. La Torre, BLIND BOLT UTILIZING DISTORTABLE COLLAR AND DEFORMABLE LOCKING NUT MEMBER, **filed** Apr. 12, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71-877-HP, *National Screw & Manufacturing Co.* v. *Lockheed Aircraft Corp. et al.*

2,773,119, L. W. Parker, TUNING SYSTEM FOR RADIO AND TELEVISION, **filed** Apr. 20, 1971, D.C., S.D. Fla. (Miami), Doc. 71-603-C-CA, *Louis W. Parker* v. *Motorola, Inc. et al.*

2,774,951, Kinkaid and Hammell, TERMINAL CLIP, **filed** May 18, 1971, D.C., N.D. Ill. (Chicago), Doc. No. 71c1210, *AMP Inc.* v. *Ramex Mfg. Co.*

2,776,214, Lloyd and Harriman, METHOD OF TREATING EGG WHITES, filed Mar. 18, 1968, D.C. Del. (Wilmington), Doc. 3502–C, *Armour and Company* v. *Standard Brands, Inc.* Order of dismissal, on agreement, case dismissed with prejudice, May 3, 1971.

2,777,416, W. C. Messick, FIRE ALARM DEVICE, filed Apr. 19, 1971, D.C., E.D. Pa. (Philadelphia), Doc. CA–71–917, *Falcon Safety Products Inc.* v. *Standard Farrington Alarm Signal Corp. et al.*

2,800,631, Suess, Trenkler, Hauttmann and Rinesch, METHOD OF CARRYING OUT MELTING PROCESSES, filed Apr. 1, 1971, D.C. Ind. (Hammond), Doc. 71–H–91 (2), *Kaiser Industries Corporation et al* v. *Bethlehem Steel Corporation.* Same, filed Apr. 1, 1971, D.C., N.D. Ind. (Hammond), Doc. 71–H–92 (2), *Kaiser Industries Corporation et al.* v. *Inland Steel Company.* Same, filed Apr. 1, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c812, *Kaiser Industries Corporation et al.* v. *United States Steel Corporation.* Same, filed Apr. 1, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c816, *Kaiser Industries Corp. et al.* v. *International Harvester Company (Wisconsin Steel Division).* Same, filed Apr. 1, 1971, D.C. Del. (Wilmington), Doc. 4094, *Kaiser Industries Corporation et al.* v. *Wheeling-Pittsburgh Steel Corporation.* Same, filed Apr. 1, 1971, D.C. Del. (Wilmington), Doc. 4095, *Kaiser Industries Corporation et al.* v. *Ford Motor Company.* Same, filed Apr. 1, 1971, D.C., S.D. Ill. (Springfield), Doc. 4788, *Kaiser Industries Corporation et al.* v. *Granite City Steel Company.* Same, filed Apr. 1, 1971, D.C. W.D.N.Y. (Buffalo), Doc. C–1971–151. *Kaiser Industries Corporation et al.* v. *Republic Steel Corporation.*

2,812,898, E. H. Buell, REVERSE ACTION ROTORS FOR USE IN A JET PROPULSION SYSTEM; **2,871,982,** same, LUBRICATING, COOLING AND OIL SEALING SYSTEM FOR COUNTER ROTATING ENGINES, filed Dec. 17, 1970, D.C., N.D.N.Y. (Utica), Doc. 70–CV–447, *Gino Pietropaoli, executor for Ernest H. Buell, deceased* v. *United Aircraft Corporation.* Complaint dismissed without prejudice, Apr. 28, 1971.

2,871,982. (See 2,812,898.)

2,922,718, I. S. Saverslak, METHOD OF PREPARING COOKED FOWL; **3,036,922,** same, PROCESS OF PREPARING BONELESS COOKED POULTRY PRODUCT, filed Apr. 1, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c810, *Irving S. Saverslak* v. *Davis Cleaver Products Co.*

2,942,512. (See 3,038,363.)

2,949,053. (See 3,038,363.)

2,953,279, R. S. Coffman, SAFETY PRESSURE RELIEF DEVICE, filed June 2, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–1326–F, *Black, Sivalls and Bryson, Inc.* v. *Ametek, Inc.*

2,960,328, M. C. Tate, WEIGHING APPARATUS AND SYSTEMS, filed Jan. 17, 1962, D.C., S.D.N.Y., Doc. 62–C–265, *The A. H. Emery Company* v. *Marcan Products Corporation et al.* Filed Judgment #71,429 in favor of plaintiff, Apr. 7, 1971.

2,976,576, Wichterle and Lim, PROCESS FOR PRODUCING SHAPED ARTICLES FROM THREE-DIMENSIONAL HYDROPHILIC HIGH POLYMERS; **3,220,960,** same, CROSS-LINKED HYDROPHILIC POLYMERS AND ARTICLES MADE THEREFROM, filed May 13, 1970, D.C., W.D.N.Y. (Buffalo), Doc. C–1970–212, *Griffin Laboratories, Inc.* v. *National Patent Development Corp. and Flexible Contact Lens Corporation.* Voluntary dismissal, May 14, 1971.

2,981,689, E. Albers-Schoenberg, SQUARE LOOP FERRITES, filed Feb. 24, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c497, *Electronic Memories & Magnetics Corp. etc.* v. *Control Data Corporation.*

3,005,375, L. Sherman, BLOOD TYPING SLICES, filed May 5, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–1098–RJK, *Leonard Sherman* v. *Jack Rubin, doing business as Clini-Tek Specialties, Jackson Products, and Omni-Tek.*

3,033,988, H. E. Edgerton, METHOD OF AND APPARATUS FOR THE CONTROL OF ELECTRIC IMPULSES; **3,519,879,** F. T. Ogawa, FLASH APPARATUS WITH AUTOMATIC LIGHT TERMINATION HAVING GATING AND ANTICIPATION MEANS; **Re. 26,999,** F. P. Elliott, CONTROL SYSTEM FOR TERMINATING THE DISCHARGE THROUGH A FLASH LAMP, filed Feb. 26, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c515, *Honeywell, Inc., EG & G Inc.* v. *Metz Apparatewerke et al.*

3,036,922. (See 2,922,718.)

3,038,363, B. F. Miessner, ELECTRONIC PIANO; **2,942,512,** same; **2,949,053,** C. W. Andersen, TONE GENERATOR, filed May 24, 1971, D.C., N.D. Tex. (Dallas), Doc. CA–3–4803–C, *The Wurlitzer Company* v. *Electrokey, Inc. et al.* Same, filed May 12, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1146, *The Wurlitzer Company* v. *Neil A. Kjos Music Company.*

3,078,477, Schmid and Maciukiewicz, WALL CLOSET CARRIER, filed Feb. 27, 1970, D.C., N.D. Ohio (Cleveland), Doc. C70–192, *Zurn Industries, Inc.* v. *Josam Manufacturing Co.*

3,220,960. (See 2,976,576.)

3,238,736, H. K. Macintosh, LIQUID NITROGEN FREEZING SYSTEM; **3,345,828,** Klee and Berreth, PARALLEL FLOW CRYOGENIC FREEZER; **3,403,527,** Berreth, Howells, Klee and Miller, TRANSVERSE-PARALLEL FLOW CRYOGENIC FREEZR, filed Mar. 26, 1969, D.C., M.D. Fla. (Tampa), Doc. 69–132–C, *Elmwood Liquid Products Inc. and Reliquifier Corporation of America* v. *Singleton Packing Corporation and Air Products & Chemicals Inc.* Action dismissed, counterclaims dismissed on merits, Mar. 11, 1971.

3,345,828. (See 3,238,736.)

3,380,553. (See 2,600,236.)

3,381,332. (See D. 182,889.)

3,381,333. (See D. 182,889.)

3,403,527. (See 3,238,736.)

3,513,718, J. J. Tomecek, CONTROL SYSTEM ADJUSTMENT MEANS, filed Mar. 1, 1971, D.C., E.D. Mich. (Detroit), Doc. 361,123, *Robin Products Co.* v. *Jerry J. Tomecek.*

3,519,879. (See 3,033,988.)

Re. 25,999. (See 3,033,988.)

D. 182,889, V. K. Fremstad, HINGE OR SIMILAR ARTICLE; **3,381,332,** Jerila and Fremstad, SELF-LATCHING HINGE; **3,381,333,** T. T. T. Jerila, SELF-LATCHING MECHANISM FOR HINGES, filed Mar. 19, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–650–WPG, *Ajax Hardware Manufacturing Corp.* v. *Jaybee Manufacturing Corporation.*

New Procedures for Processing Orders for Certified Copies When Material Is Not Available for Photocopying

The previous practice of the Document Services Division in handling customer's requests for certified copies of material not yet processed in the Application Division has been to return the order to the customer requesting him to reorder 30 days after receipt of his Official Filing Receipt.

In order to improve this procedure, as of August 2, 1971, all requests for certified copies of material that has not been processed in the Application Division and has not been placed on microfiche are processed in the following manner.

1. Each order is given a control number.
2. The customer is notified as follows:
   - *a.* He will receive an acknowledgment of the receipt of his order.
   - *b.* He will be given the assigned control number for ease of reference in case an inquiry is necessary.
   - *c.* He will be informed that his order will be held in the Document Services Division until the copy can be reproduced from microfiche. No definite time can be given.
3. An Advance Order File has been set up in the Service Unit of the Document Services Division and the microfiche is checked daily.

For further service to its customers, the Document Services Division will furnish the Serial Number and Filing Date of the latest application available on microfiche for publication in the OFFICIAL GAZETTE.

ROBERT J. RISH,
Acting Assistant Commissioner for Administration.

Aug. 2, 1971.

Dedications

2,758,865.—*Winfred M. Brooks*, West Orange, N.J. SEAL. Patent dated Aug. 14, 1956. Dedication filed June 16, 1971, by the assignee, *E. J. Brooks Company*.

Hereby dedicates to the Public the term thereof remaining after Oct. 1, 1970.

3,325,988.—*Norman E. Klein* and *Edgar Dare Bolinger*, Spartanburg, S.C. BALANCED ELASTICIZED MULTIFILAMENT YARN. Patent dated June 20, 1967. Dedication filed June 22, 1971, by the assignee, *Deering Milliken Research Corporation*.

Hereby dedicates to the Public the entire terminal portion of the term thereof falling on and after Jan. 5, 1977.

Disclaimers

3,373,265.—*Louis A. Smitzer*, Chicago, Ill. INFORMATION STORAGE AND RETRIEVAL PROCESS AND CODED RECORD CARD THEREFOR. Patent dated Mar. 12, 1968. Disclaimer filed Mar. 3, 1971, by the assignee, *Bell & Howell Company*.

Hereby enters this disclaimer to claims 2 and 6 of said patent.

3,552,469.—*Lee M. Corless*, Grosse Pointe Woods, Mich. TIRE BEAD SEATER. Patent dated Jan. 5, 1971. Disclaimer filed June 16, 1971, by the assignee, *Bruce Caulkins, Inc.*

Hereby enters this disclaimer to claims 10, 20, 24, 25 and 27 of said patent.

Certificates of Correction for the Week of Sept. 14, 1971

D. 220,316	3,549,823	3,565,578	3,574,737
D. 220,425	3,551,418	3,565,592	3,574,791
3,254,889	3,551,899	3,566,619	3,575,039
3,256,012	3,552,336	3,566,622	3,575,361
3,372,006	3,552,973	3,566,892	3,575,695
3,438,339	3,553,393	3,567,023	3,575,848
3,462,416	3,554,187	3,567,095	3,576,617
3,499,779	3,554,612	3,567,127	3,576,724
3,501,138	3,555,813	3,567,843	3,576,784
3,504,005	3,556,208	3,568,159	3,576,788
3,509,127	3,556,720	3,568,171	3,577,123
3,514,584	3,558,459	3,568,681	3,577,340
3,518,221	3,558,601	3,569,659	3,577,391
3,518,311	3,558,616	3,569,867	3,577,448
3,521,739	3,558,739	3,570,344	3,577,615
3,528,433	3,559,025	3,570,420	3,577,806
3,529,037	3,560,505	3,571,516	3,577,827
3,531,233	3,560,579	3,571,952	3,578,180
3,532,253	3,561,310	3,572,478	3,578,255
3,538,089	3,561,493	3,572,505	3,578,482
3,540,391	3,562,337	3,572,531	3,578,900
3,542,859	3,562,990	3,572,732	3,578,903
3,543,212	3,563,217	3,573,245	3,579,456
3,543,819	3,563,520	3,573,743	3,579,486
3,544,179	3,563,784	3,573,872	3,579,564
3,544,435	3,564,051	3,574,283	3,579,568
3,545,580	3,564,299	3,574,337	3,579,817
3,546,604	3,564,782	3,574,338	3,580,426
3,549,602	3,564,876	3,574,571	3,580,929

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 24, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
* Date of Oldest Application (New)	
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-04-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	*3-05-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-15-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-03-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-24-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	12-11-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	*3-23-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-14-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-18-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	5-05-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	8-06-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	7-06-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	*5-14-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-04-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	9-11-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	7-10-70

Expiration of patents: The patents within the range of numbers indicated below expire during August 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

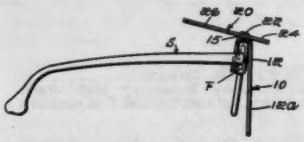
Patents..... Numbers 2,685,085 to 2,688,132, inclusive
Plant Patents..... Numbers 1,294 to 1,299, inclusive

PATENTS

GRANTED SEPTEMBER 14, 1971

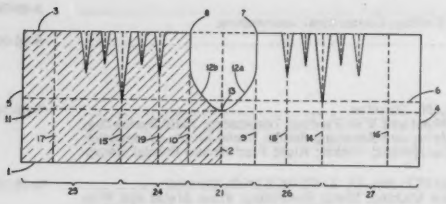
GENERAL AND MECHANICAL

3,604,013
EYE PROTECTOR FOR USE WITH SPECTACLES
Harold W. Hammond, 67 Hyslop Road, Brookline, Mass.
Filed Sept. 23, 1969, Ser. No. 860,202
Int. Cl. G02c *9/04*
U.S. Cl. 2—13 **3 Claims**



An eye protector has a visual member having two shading visual portions spaced oppositely apart which also serve as attaching or supporting means for mounting on a spectacle frame. An overhead shade, which is supported by said visual member, extends forwardly and rearwardly from the latter, and protects the eyes from overhead light.

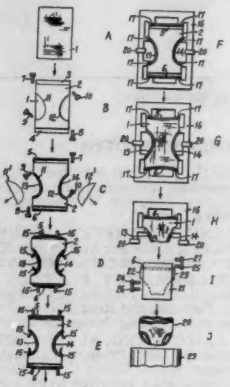
3,604,014
SEMICULOTTE SKIRT
Yolande Saint-Arnaud, 3255 Ridgewood Ave. Apt. #6, Montreal 247, Quebec, Canada
Filed Apr. 18, 1969, Ser. No. 817,325
Claims priority, application Canada, Jan. 31, 1969, 41,709
Int. Cl. A41d *1/14*
U.S. Cl. 1—212 **2 Claims**



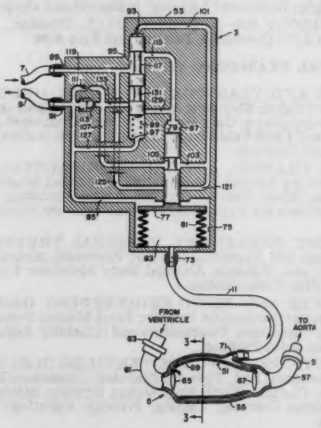
A semiculotte skirt which is wrapped around the body of the wearer such that it passes in front of the right leg to the back of the wearer, between the legs to the front of the wearer and around the front of the left leg to the back of the wearer.

3,604,015
WEARING APPAREL
Michael D. Dove, Hertford, England, assignor to Courtaulds Limited, London, England
Filed Oct. 23, 1968, Ser. No. 769,936
Claims priority, application Great Britain, Oct. 26, 1967, 48738/67
Int. Cl. A41b *9/04*
U.S. Cl. 2—224 **7 Claims**

A continuous process for manufacturing briefs in which a flat blank is formed having side edges with leg-shape cutouts and end edges destined to form the waist. Elastic is bound to the leg holes and the end edges under controlled tension, and the blank is folded and the sides joined to form the garment.



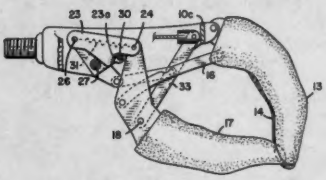
3,604,016
MULTIPLE FUNCTION BLOOD COUPLER
Thomas C. Robinson, West Newton, and Fred N. Huffman, Sudbury, both of, Mass., assignors to Thermo Electron Corporation, Waltham, Mass.
Filed Feb. 6, 1969, Ser. No. 797,068
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **4 Claims**



An integrated blood coupler for a totally implantable heart-assist circulatory support system incorporating a diaphragm-type blood pump adapted to be connected between the left ventricle and aorta of the host, in which the pumping energy for the assist pump is produced by an im-

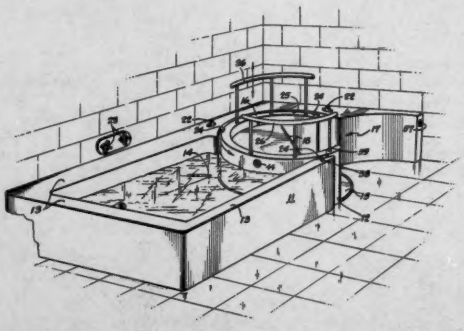
plantable power supply that inherently produces waste heat as a byproduct, wherein the waste heat is discharged to the blood stream through the diaphragm of the blood pump, and in which the diaphragm serves as the physiological sensor for producing pressure signals to synchronize the assist system with the circulatory system of the host.

3,604,017
SPRING-ACTUATED PROSTHETIC HAND WITH A FRICTIONAL LATCHING CLUTCH MEANS
Robert N. Brown, Los Gatos, and Glenn E. Brown, Cupertino, both of, Calif., assignors to D. W. Dorrance Co., Inc., Campbell, Calif.
Continuation-in-part of application Ser. No. 812,194, Apr. 1, 1969. This application Nov. 10, 1969, Ser. No. 875,205
Int. Cl. A61f *1/06*
U.S. Cl. 3—12.7 **2 Claims**



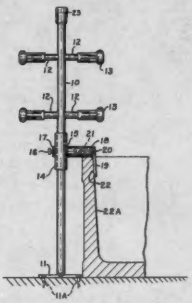
A prosthetic hand of lightweight construction having pivotally attached fingers including a forefinger, a middle finger proximal to the forefinger, and thumb which open and close simultaneously. The thumb is provided with an extension that is connected to a rotatable member which is spring biased to move the fingers into their closed position for gripping an object. The lever connecting the thumb extension to the rotatable member is provided with a frictional clutch surface that restrains moving of the fingers from their closed position. unless an excessive predetermined opening force is exerted on the fingers which could damage the hand. A cable-actuated lever is connected to the rotatable member for overcoming this restraining action and moving the fingers on their pivots to the open position to release their grip on said object. The frame holding these fingers and members is encased in a human-looking self-skin foam.

3,604,018
BATHTUB
Malachy J. Moran, 13875 Saratoga Ave., Saratoga, Calif.
Filed Dec. 24, 1969, Ser. No. 887,923
Int. Cl. A47k *3/00*
U.S. Cl. 4—173 **6 Claims**



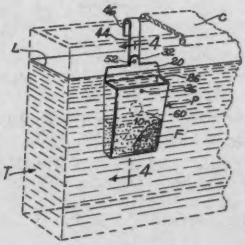
A bathtub for invalids includes a fixed part and a rotatable drum or cylindrical part. The fixed part includes sidewalls on three sides with the other side abutted against the rotatable part. The rotatable part has cylindrical sidewalls with a segment open to provide an entrance into the bathtub. With drum part rotatably positioned such that the open segment faces away from the fixed part of the tub, the cylindrical walls abut against and span across the open side of the fixed part of the bathtub to retain water therein. An invalid may sit on a seat within the drum part and the drum may be rotated until the open segment faces the open side of the fixed part of the bathtub. The seat may then be lowered to the bottom of the tub or to any desired intermediate level. To get out of the tub, the seat is raised and then the drum is rotated until the open segment faces away from the remainder of the bathtub. Alternatively, an invalid may enter and stand in the drum part with the seat in a lowered position recessed in the bottom of the drum. A hand rail may be raised from a recessed position in the cylindrical wall for the invalid to grasp while standing and while the drum is rotating for either entrance into or departure from the bathtub.

3,604,019
BATHTUB SAFETY APPLIANCE
Alton B. Garner, Box 727, Wichita Falls, Tex.
Filed Nov. 17, 1969, Ser. No. 877,239
Int. Cl. A47k *3/12*
U.S. Cl. 4—185 H **15 Claims**



A safety device for assisting persons into and out of a bathtub. The safety device is equipped with means that facilitate easy attachment to the tub and the floor while providing supporting means for the user.

3,604,020
TOILET TANK SANITIZING DISPENSER
Nickolaus Moisa, 301 Madison St., Yorkville, Ill.
Filed June 25, 1969, Ser. No. 836,263
Int. Cl. E03d *9/02*
U.S. Cl. 4—228 **8 Claims**

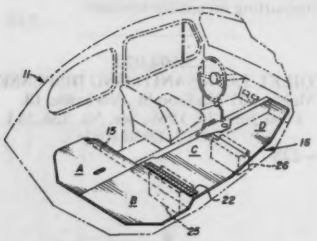


A dispenser package for sanitizing toilet tanks and bowls including a body portion suspendible below normal water level in a toilet tank and a strap hanger for so suspending the body portion. The body portion contains a sanitizing formulation. The package provides a pair of openings for circulation of water through the package. The formulation contains a relatively insoluble dispenser aid such as ground gravel to maintain the formulation's water permeability during the life of the package.

3,604,021
URINAL TABLET
Albert C. Nolte, Jr., Oyster Bay Cove, N.Y., assignor to Elton Industries Corporation, New York, N.Y.
Filed May 15, 1969, Ser. No. 824,999
Int. Cl. E03d *9/02*
U.S. Cl. 4—231 **4 Claims**

A tablet for use in a toilet, urinal, or the like which has an ingredient a substance for increasing the decompositional rate of the waste material in a cesspool sewage system or the like.

3,604,022
FOLDABLE PLATFORM ASSEMBLY FOR VEHICLES
Jack V. Smith, 502 Racine Ave., Aurora, Colo.
Filed May 16, 1969, Ser. No. 825,294
Int. Cl. A47d *7/00*
U.S. Cl. 5—118 **4 Claims**



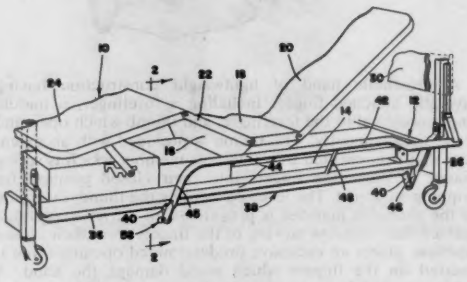
A foldable floor platform assembly has flat panel sections hingedly connected together at adjacent edges which extend to provide a generally level support area above the floor of a vehicle and fold into a compact portable form which may be carried within the vehicle. Collapsible box-shaped base units support the connected ends of the panel sections along and on both sides of the hinged connections with the free ends adapted to engage the floor surface in the vehicle to support the assembly in a generally level position.

3,604,023
TRUE LATERAL BODY POSITIONING ARRANGEMENT FOR RADIOGRAPHY
Edmond J. Lynch, 1511 Midvale Ave., Catonsville, Md.
Filed Aug. 27, 1969, Ser. No. 853,396
Int. Cl. A47c *21/00*; **A 47g** *9/00*
U.S. Cl. 5—327 **2 Claims**

A body and support arrangement is provided for adjusting and supporting a patient lying laterally recumbent upon flat examination tables where the body members must be maintained immobile and aligned as nearly as possible parallel with respect to the top of the table and positioned as if in a lateral, vertical stance. A plurality of positioner blocks are

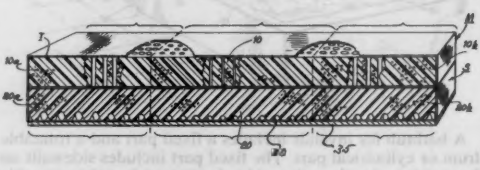
provided having body member accepting notches or bridges and surfaces for holding the ankles and knees, and supporting the abdomen and pelvis in a true lateral position.

3,604,024
SNUBBER FOR SAFETY SIDES
Xavier Walter Polanski, Lansing, Ill., assignor to Simmons Company, New York, N.Y.
Filed July 14, 1969, Ser. No. 841,512
Int. Cl. A47c *7/50*, *22/00*
U.S. Cl. 5—331 **5 Claims**



A retarding device for braking the free fall of a safety side on an invalid bed or the like, comprising a wedge on at least one of two relatively rotatable members that are in sliding contact with one another and arranged so that the wedge serves to increase the pressure of the sliding contact as the safety side swings down from its erected position to its stowed position. The wedge is molded of resiliently compressible material in a form to facilitate its installation at a pivot joint, and to prevent its rotation with respect to one of the two relatively rotatable members.

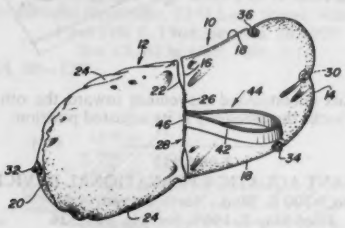
3,604,025
FOAM BEDDING
Billy P. Mims, Oak Park, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed Apr. 18, 1969, Ser. No. 817,478
Int. Cl. A47c *23/00*, *25/00*
U.S. Cl. 5—345 **1 Claim**



Foam resin bedding for use a box spring and mattress, both having areas of differential resistance to weight, the middle area having greater resistance than the end areas. This is accomplished in the box spring by forming on one side integral tapered protuberances extending normally from the face thereof, the protuberances in the midportion being smaller

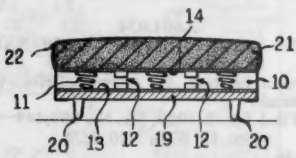
and closer spaced than those at the ends. In the mattress element the differential resistance is obtained by varying the size and or number of the pins extending through the foam body in the mold, as regards the midportion and end portions of the molded body.

3,604,026
TRAVEL PILLOW
Bernice Holmen Scheips, 1011 E. St., Fairbury, Nebr.
Filed Oct. 27, 1969, Ser. No. 869,460
Int. Cl. A47g *9/00*
U.S. Cl. 5—337 **6 Claims**



A foldable and spreadable pillow wherein duplicate padlike half-sections when folded and fastened together provide a pillow which is comparable in size and shape with individual headrests currently used on the backrests of automobile seats. These suitably cushioned half-sections have limited median portions of side-by-side edge portions stitched and thus hinged together. Outer marginal edges are provided with connectable snap fasteners which hold the half-sections folded. Median portions of one half-section also have snap fasteners which permit said half-section to be manually folded and doubled upon itself and crammed and lodged in a limited holding space whenever available. Strap-Type handles are also provided.

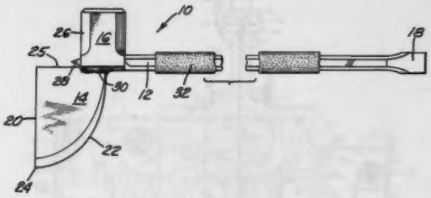
3,604,027
CONSTRUCTION FOR BED OR CHAIR
Shunichi Konno, 13, 17-Ban Daito-Cho Ashiya, Hyogo, Prefecture, Japan
Filed Aug. 4, 1969, Ser. No. 847,061
Int. Cl. A47c *23/00*
U.S. Cl. 5—351 **2 Claims**



A bed or chair construction is provided with a plurality of helical springs for resiliently supporting a horizontal top plate above the frame. At least one electromagnet is secured to each of the top plate and the frame, and the electrical circuit for the electromagnets energizes the electromagnets in such a manner that the facing portions of the electromagnets on the top plate and on the frame have the same magnetic polarity. The electrical circuit also includes a variable resistor for varying the magnetic force.

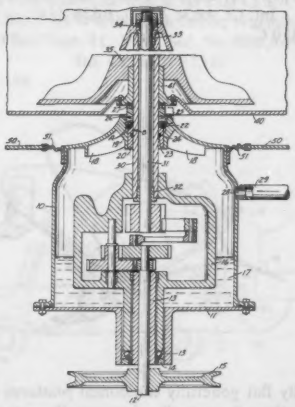
3,604,028
RESCUE AXE
Jerry Wardwell, 40106 Lynnwood, Hemet, Calif.
Filed Jan. 8, 1969, Ser. No. 789,784
Int. Cl. B25f *1/00*
U.S. Cl. 7—8.1 **3 Claims**

A combination tool for use by wreckers, firemen, and other rescue workers in cutting through sheet metal structures, such as wrecked automobiles, to make an opening through which trapped persons can escape. The tool comprises an elongated handle havinga pointed axe blade and sledge hammer head at one end, together with metal-gripping means whereby the blade can be driven into sheet metal and then worked with a lever action in the manner of a can



opener, to cut an opening in the sheet metal. The sledge hammer head lends mass to the axe blade, and also provides means for breaking solid obstacles, or for driving stakes. At the other end of the handle is a pry bar.

3,604,029
METHOD AND APPARATUS FOR SEALING AND LUBRICATING A WASHING MACHINE TRANSMISSION
Neil A. Bain, 1024 E. Rose St., St. Paul, Minn.
Filed Aug. 20, 1969, Ser. No. 851,693
Int. Cl. D06f *35/00;* **F16j** *15/54;* **F16n** *1/00*
U.S. Cl. 8—159 **3 Claims**

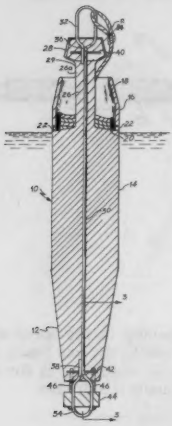


The normally frequent tendency of certain automatic washers to soil clothes by oil leaking from the transmission is dramatically reduced by placing a snug seal around the transmission drive tube and venting the gear case oil bath to the atmosphere.

3,604,030
BUOY FOR MOORING VESSELS
Harold E. Claflin, 288 Bar Cliff Ave., Chatham, Mass.
Filed June 30, 1969, Ser. No. 837,846
Int. Cl. B63b *21/52*
U.S. Cl. 9—8 **2 Claims**

A buoy for a floating vessel has a compartment at the

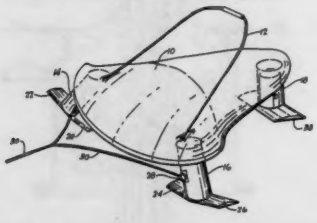
upper portion, in which to store and protect a mooring line or rope when not in use. Above the compartment is an entrance defined by a neck and a head, above it, which receives said line on its way into the compartment.



3,604,031
HYDROFOIL BOARD

Michael J. Cahill, 53A Beaver Terrace Circle, Framingham, Mass., and Ernest G. La Casse, 2008 Bentely Place, Charlotte, N.C.

Filed Feb. 25, 1969, Ser. No. 802,032
Int. Cl. A63c *15/00;* **B63b** *1/30*
U.S. Cl. 9—310 C **4 Claims**



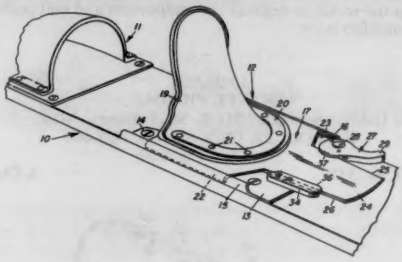
A generally flat generally horizontal platform is provided with a plurality of generally downwardly extending struts secured at upper ends to the bottom surface of the platform and at bottom ends to corresponding inclined foils. The apparatus is adapted to be towed in water behind a motor boat and to be ridden in the same manner as water skis and the like. In use the platform rises vertically out of the water to a height determined by the length of the struts.

3,604,032
ADJUSTABLE WATER SKI BINDING

Adolf Kiefer, and William J. Meucci, both of 2051 Railroad Ave., Northfield, Ill.

Filed May 26, 1969, Ser. No. 827,757
Int. Cl. A63c *15/06*
U.S. Cl. 9—310 AA **19 Claims**

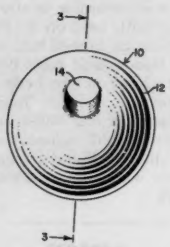
A water ski binding including two assemblies for engaging the foot of the user, one of the assemblies being slidable toward and away from the other assembly for adjustment to the size of the foot, the movable assembly including means which permits unrestrained movement toward the other assembly, but locks the assembly in its adjusted position.



3,604,033
BUOYANT AQUATIC RECREATIONAL DEVICE

John L. Lino, 8200 E. Blvd., North Bergen, N.J.

Filed May 2, 1969, Ser. No. 821,326
Int. Cl. B63c *9/10*
U.S. Cl. 9—340 **3 Claims**

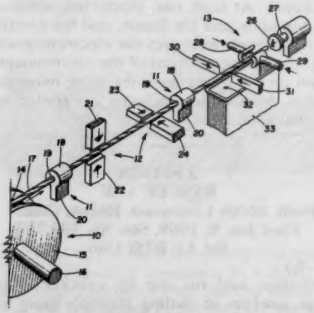


A buoyant aquatic recreational device of generally spherical shape having at least one opening therethrough which opening does not go through the geometrical center of the buoyant body and is sized to receive a person's arms so that when the body is placed in water under a human, it will support the human.

3,604,034
METHOD AND APPARATUS FOR MAKING NAILS WITH FLAT CIRCULAR HEADS

Walter Hermann Leistner, 97 Alamosa Drive, Willowdale, Ontario, Canada

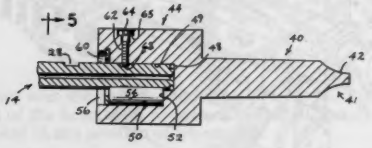
Filed Jan. 7, 1969, Ser. No. 789,449
Int. Cl. B21g *3/20, 3/28*
U.S. Cl. 10—46 **10 Claims**



Apparatus and a method for making nails with flat circular heads and a shank of a noncircular cross-sectional shape and

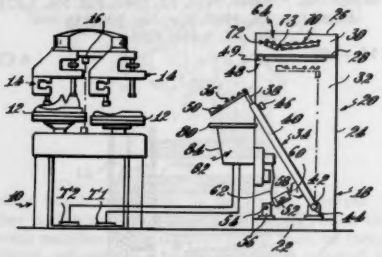
the method comprises: unwinding drawn wire from a roll of wire and advancing the wire by an intermittent drive means; passing the wire through guide means to provide a straight length of wire; engaging a portion of the wire with die means to form a cylindrical portion on the wire having a circular cross-sectional shape and a length substantially sufficient to form the head of the nail; feeding the wire into a nail-making machine wherein the head is formed from the cylindrical portion and shearing the nail off at the end of the shank to form the nail.

3,604,035
FLOATING TAP AND TAP HOLDER
Grover Edward Hendricks, 2241 Lake Street, Niles, Mich.
Filed Feb. 5, 1968, Ser. No. 703,025
Int. Cl. B23g *1/00, 5/06, 5/14*
U.S. Cl. 10—129 **5 Claims**



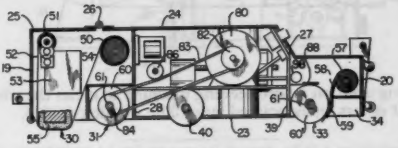
A tap and tap holder combination in which the tap has an elongated straight fluted shank. The tap holder has a shank portion for mounting in a machine spindle and a socket portion having an axial socket bore and a longitudinal internal groove mounting a longitudinal lug therein. The tap is loosely mounted within the socket bore with the longitudinal lug projecting into the tap shank flute.

3,604,036
COMBINATION SOLE-PRESSING AND ACTIVATING APPARATUS
Robert B. Dunlap, Medway, Mass., assignor to Compo Industries, Inc., Waltham, Mass.
Filed Apr. 16, 1970, Ser. No. 29,136
Int. Cl. A43d *00/00*
U.S. Cl. 12—1 R **17 Claims**



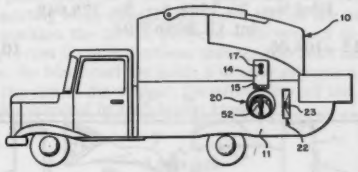
A sole-pressing machine having right and left sole-pressing assemblies for attaching soles to lasted uppers, a conditioner having right and left supports movable into and out of confronting relation to a heating grid for activating adhesive preapplied to soles, said sole supports having an initial position withdrawn from confronting relation to the grid, and a control circuit containing a starting switch operable to initiate a cycle of operation by effecting movement of the right sole support into confronting relation to the grid while the left sole support remains out, and cycling switches associated with the treadles by means of which operation of the right and left sole-pressing assemblies are effected, operable following initiation of a cycle of operation alternately to effect movement of the left sole support into operative position in consonance with the operation of the right sole-pressing assembly and to effect movement of the right sole support into operative position in consonance with the operation of the left sole-pressing assembly.

3,604,037
AUTOMATIC FLOOR MAINTENANCE MACHINE
Robert E. Varner, Cheyenne, Wyo., assignor to Paul V. Horst, Eastlake, Colo.
Filed Dec. 23, 1968, Ser. No. 785,991
Int. Cl. A47l *11/282*
U.S. Cl. 15—4 **14 Claims**



The apparatus of the present invention is specifically adapted for use in dressing, buffing and cleaning bowling lanes automatically through a coordinated sequence of operations which can be preselected and automatically performed over a given distance of travel. The machine is equipped with retractable cleaning and dressing buffer units which are driven independently of the main drive to selectively engage the lane surface either independently of one another, or simultaneously; and in association with the activation of liquid- or fluid-dispensing units is capable of carrying out a variety of different operations at selected intervals automatically and without interruption along the course of travel of the apparatus.

3,604,038
REFUSE CONTAINER AND LID CLEANER
Rocco F. Di Ilio, 708 Worthington Drive, Warminster, Pa.
Filed Sept. 11, 1969, Ser. No. 856,949
Int. Cl. A47l *25/00*
U.S. Cl. 15—56 **10 Claims**

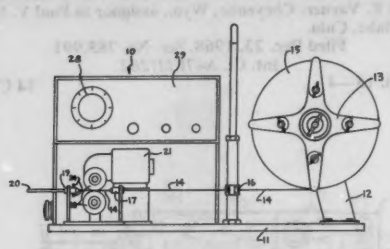


A refuse truck having integral therewith a refuse container and lid cleaner. The truck contains openings in one of the side portions thereof to provide access to the cleaners. The container cleaner includes an L-shaped brush provided with specific mounting and water supply connecting means. The shape of the brush permits the effective cleaning of the entire inside of the container.

3,604,039
CLEANING MEANS FOR GUIDE BUSHINGS
Hal F. Aldridge, Raleigh, N.C., assignor to Aeroglide Corp., Raleigh, N.C.
Filed Sept. 24, 1969, Ser. No. 860,609
Int. Cl. B21c *35/06*
U.S. Cl. 15—102 **3 Claims**

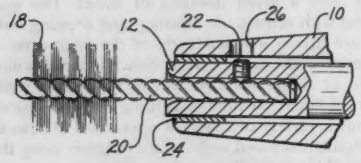
In abstract, a preferred embodiment of this invention is a

fibrous material inserted in a vertical opening of a guide



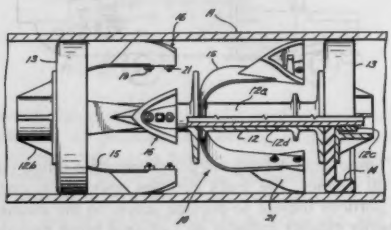
bushing used on a wire-feeding machine to clean the wire before it enters an associated automatic welding device.

3,604,040
CLEANING TOOL FOR PIPE AND FITTINGS
Richard L. Cohen, 33 Briar Lane, Roslyn Heights, N.Y.
Filed Mar. 11, 1969, Ser. No. 806,138
Int. Cl. B08b *9/02*
U.S. Cl. 15—104.1 **4 Claims**



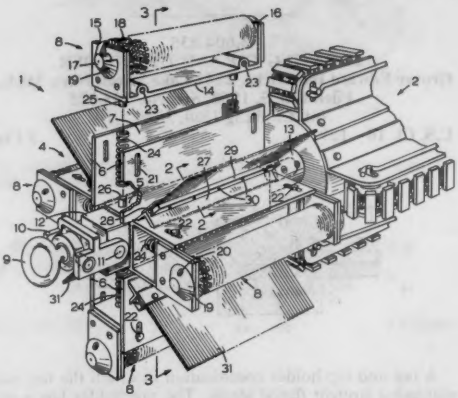
A power-driven rotary tool has a chuck that cooperates with a tool shaft having a long spiral groove. The tool is drawn into the power-driven chuck and then it is rotated. Reverse relative rotation of the tool causes it to be ejected. The preferred tool is a wire brush having bristles held between twisted wires that form the tool shaft and provide spiral grooves.

3,604,041
PIPELINE CLEANING DEVICE
Burton Ver Nooy, Broken Arrow, Okla., assignor to T. D. Williamson, Inc., Tulsa, Okla.
Filed Nov. 26, 1968, Ser. No. 778,948
Int. Cl. B08b *9/04*
U.S. Cl. 15—104.06 **10 Claims**



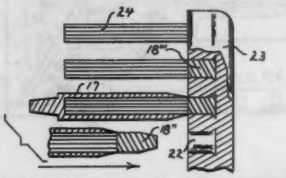
A pipeline cleaning device comprising a body adapted to be moved forwardly through the pipeline, a plurality of springs mounted on the body, and a scraping element carried on each spring for engaging the inner wall of the pipeline in circumferentially spaced-apart relation. Each scraping element includes a base connected to the spring, a V-shaped blade upstanding from the base for tightly engaging the pipeline wall with its apex on the forward end thereof, and a relatively stiff rod extending from the base for tightly engaging at its outer end with the pipeline wall between the sides of the blade. Each of the base, blade, and rod is formed of urethane.

3,604,042
PIPE-CLEANING TOOL
Raymond Muir Bremner, Don Mills, Ontario, and James M. Frew, Weston, Ontario, both of, Canada, assignors to Raymond M. Bremner, Ontario, Canada
Filed Oct. 23, 1969, Ser. No. 868,764
Int. Cl. B08b *9/02*
U.S. Cl. 15—104.13 **4 Claims**



A cleaning device for removing fibrous material from the internal surface of a pipe comprises a rotary head adapted to be driven by a motor and to be towed through the pipe by a cable. The rotary head comprises a frame around which are distributed four scraper assemblies and four flexible combs. Each scraper assembly consists of a series of coaxial, freely rotatable cutting wheels each having a scraping edge and mounted on a shaft extending parallel to and spaced from the axis of the frame; the scraper assemblies are spring-biased away from said axis into engagement with the pipe surface.

3,604,043
BRUSH AND BRUSH CONSTRUCTIONS
John Connell Lewis, Jr., Middlebury, Vt., assignor to Tucel Industries, Inc., Middlebury, Vt.
Division of Ser. No. 578,840, Sept. 12, 1966, Pat. No. 3,471,202.
Filed Jan. 24, 1969, Ser. No. 800,330
Int. Cl. A46b *3/04*
U.S. Cl. 15—159 **6 Claims**



A tufted brush and tufted modular construction are presented comprising synthetic filament tufts fused at the base end and integrally attached to a support means.

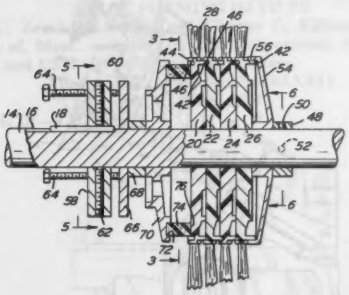
3,604,044
BRUSH WITH MOVABLE HEAD
Ronald W. Johnson, 3053 Cheyenne Road, Riverside, Calif.
Filed June 27, 1969, Ser. No. 837,132
Int. Cl. A46b *5/00*; **B25g** *3/38*
U.S. Cl. 15—172 **5 Claims**

A paint brush having a ball-and-socket connection between its head and handle. The handle has a ball configuration at one end which fits into a socket in the base of the brush head to form the ball-and-socket connection. The base

of the head is fitted with a wing nut having a concave forward end designed to fit congruently against the surface of the ball. The wing nut can be moved into and out of tight

contact with the ball by hand. This permits universal adjustment of the head, with respect to the handle, and locking of the head in any position of adjustment.

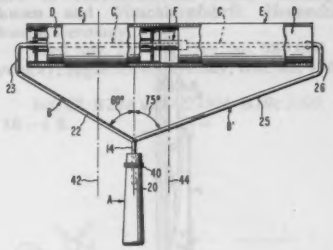
3,604,045
ROTARY BRUSH APPARATUS HAVING CONTROLLED SLIPPAGE
Courtland N. Smith, Jr., Glen Ridge, N.J., assignor to Sherman Car Wash Equipment Co., Palmyra, N.J.
Filed Mar. 10, 1969, Ser. No. 805,488
Int. Cl. A46b *13/00*
U.S. Cl. 15—181 **3 Claims**



Rotary brush apparatus is disclosed, wherein a brush member is disposed on a shaft to normally rotate therewith, the brush member being coupled to the shaft by torque limiting means, whereby the brush member is adapted to rotate with respect to the shaft when torque between the brush member and shaft exceeds a predetermined amount.

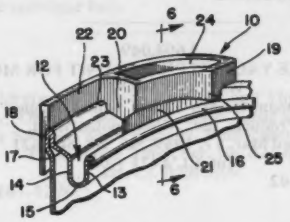
3,604,046
EXPANSIBLE PAINT APPLICATOR
Harold J. Taylor, 113 Serra Vista, Apt. D, Mountain View, Calif.
Filed May 28, 1969, Ser. No. 828,546
Int. Cl. B05c *1/08;* **B44d** *3/28*
U.S. Cl. 15—230.11 **5 Claims**

An expansible paint applicator of the roller variety is provided with two frame members. One frame member has attached thereto the applicator handle and a rotatably mounted applicator sleeve. This sleeve when used alone for painting flat surfaces paints a narrow strip in its track. The other frame member likewise has a rotatable applicator sleeve mounted thereto and is adapted for coupling to the first frame member and handle to adjoin both rotatable sleeves in contiguous end-to-end relation. When the rollers are thus conjoined, the applicator paints a wide strip in its



track coextensive with the axial length of the conjoined applicator sleeves.

3,604,047
PAINT CAN CLEANING DEVICE
Edward A. Hennigan, 201 N. Wells St., Chicago, Ill.
Filed Dec. 5, 1968, Ser. No. 781,382
Int. Cl. B44d *3/16;* **B08b** *13/00*
U.S. Cl. 15—236 **6 Claims**

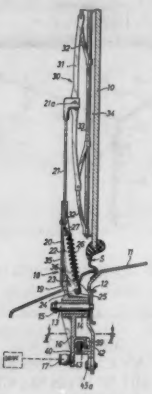


A device for removing liquid paint from the upwardly opening groove around the top of a cylindrical paint can and returning the paint to the interior of the can. Depending from a supporting body engageable with the upper edges of the can is a cleaner blade which extends into the groove and scrapes paint from the groove. A guide also depending from the supporting body engages the outer side of the top of the can to position the device properly with respect to the can and to prevent liquid paint from spilling over such outer side. Between the blade and the guide a scraper engages a top surface of the can to direct paint therefrom toward and into the groove for removal by the cleaner blade.

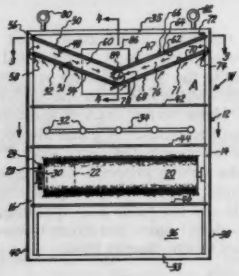
3,604,048
WINDSHIELD WIPER MECHANISM
Hubert Mainka, Buhlertal, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Apr. 8, 1970, Ser. No. 29,374
Claims priority, application Germany, Apr. 15, 1969, P 19 18 950.5
Int. Cl. B60s *1/34*
U.S. Cl. 15—250.19 **10 Claims**

A stationary pin is mounted on a motor vehicle adjacent the windshield thereof. A sleeve is journaled for turning movement on the pin and has limited freedom of axial displacement relative to the same. A pair of arms project from this sleeve at opposite radial sides. A windshield wiper assembly is mounted on one of the arms and biassed into engagement with the windshield. Drive means is coupled with the second arm for imparting to the same and thereby to the sleeve an oscillatory movement about the pin which, at the will of an operator, may be varied from effecting displacement of the wiper assembly between two operating positions to effecting displacement of the wiper assembly from one of the operating positions to a rest position. Guide means in

form of cooperating cam and follower means is provided for imparting to the sleeve in automatic response to movement of the assembly to its rest position, an axial movement with reference to the pin in a sense exerting upon the wiper assembly a second biassing force counter to the first biassing force so that the same is either partially negated or completely negated, with the wiper assembly in the latter case being lifted off the windshield.



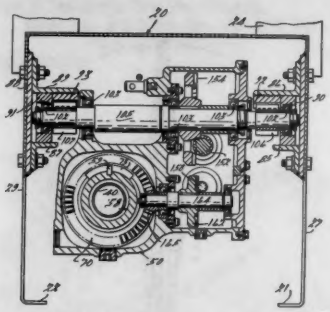
3,604,049
SQUEEGEE VACUUM PICKUP UNIT FOR MOBILE WINDOW WASHER
Frank W. Hetman, Golden Valley, Minn., assignor to Alpana Aluminum Products, Inc., Minneapolis, Minn.
Filed Mar. 17, 1969, Ser. No. 807,621
Int. Cl. A471 *1/00*
U.S. Cl. 15—302 **9 Claims**



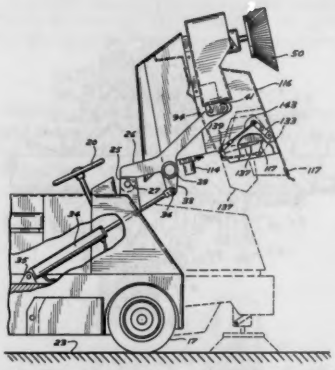
The disclosure relates to a vacuum squeegee pickup for a window washer device including a housing having suction means connected thereto, the housing further having a mouth with first and second spaced flexible elongated means on said mouth, the housing connected to the device and disposed with the flexible elongated means positioned obliquely with respect to the direction of travel of the device.

3,604,050
LONG RETRACTING SOOT BLOWER WITH SHIFTING ROLLER SUPPORTS
John E. Nelson; John R. Saltz, and Robert E. Chappell, all of Lancaster, Ohio, assignors to Diamond Power Specialty Corporation, Lancaster, Ohio
Division of Ser. No. 486,121, Sept. 9, 1965, Pat. No. 3,439,376.
Filed Dec. 3, 1968, Ser. No. 798,835
Int. Cl. F23j *3/02*
U.S. Cl. 15—317 **6 Claims**

Cylindrical rollers for supporting a lance tube of a soot blower are carried in a frame which is limitedly shiftable longitudinally when the lance tube moves axially. The rollers are journaled on axes tangent to a helix concentric with the lance tube and are carried by subframes which can be turned about radial axes to adjust their journal axes to helices of varying pitch.



3,604,051
POWERED SWEEPING MACHINE
Adolph H. Wendel, and Richard G. Worwa, both of Minneapolis, Minn., assignors to Tennant Company, Minneapolis, Minn.
Filed June 27, 1969, Ser. No. 837,168
Int. Cl. E01h *1/04*
U.S. Cl. 15—340 **9 Claims**



A powered sweeping machine having a sweeping brush and a dust receptacle to receive swept material and including lifting arms to raise the dust receptacle from a working position to position wherein it clears high obstacles for dumping. A forward curb brush is raised with the receptacle so that it is not in the way during the dumping operation. The dust receptacle is divided into an upper filter compartment and a lower compartment. A door arrangement for the dividing wall between compartments is utilized to permit dumping material from the upper compartment into the lower compartment. Clamshell-type doors on the main opening of the receptacle are used to close the opening when the receptacle is raised to its high listed position to prevent material from being discharged until the receptacle is in proper dumping position. The curb-brush mounting to the receptacle includes structure to permit it to move in several different directions and to swing out of the way of obstructions. The sweeping machine is powered through the use of a hydraulic motor with the wheel mounted directly on the shaft for the hydraulic motor to simplify mounting construction.

ERRATUM

For Class 16—35 see:
Patent No. 3,604,212

3,604,052
SELF-CAPTIVATING HANDLE

James E. Bringer, Elk Grove, and George P. Whitney, Lombard, both of, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

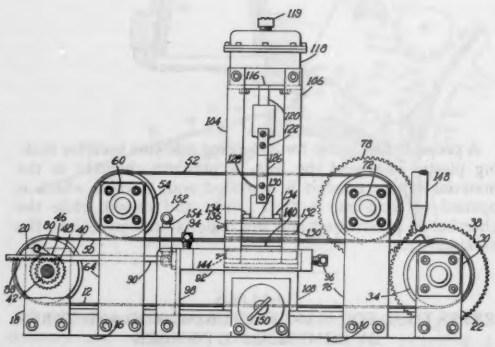
Filed Sept. 4, 1969, Ser. No. 855,246
Int. Cl. B25g *1/04*
U.S. Cl. 16—115 9 Claims

A self-captivating retractable handle for a portable television receiver cabinet is molded from an integral piece of polypropylene homopolymer plastic having an enlarged portion at one end. The other end of the handle has a downwardly extending projection hinged at the end with a second hinge located a short distance from the end of the handle. The first hinge permits bending the projection upwardly to enable the passage of the projection and the end of the handle through a pair of spaced slots in the receiver cabinet, and the second hinge is used to bend the projection back to pass it through a corresponding slot in the handle where it is locked to captivate the handle in the receiver cabinet. The resiliency of the material out of which the handle is made causes the handle to lie flat when not in use.

3,604,053
SHAPE-FORMING DEVICES

John C. Zemlin, Reading, and Charles O. Kilham, Beverly, both of, Mass., assignors to USM Corporation, Flemington, N.J. and USM Corporation, Boston, Mass.

Filed Apr. 3, 1969, Ser. No. 813,815
Int. Cl. B29c *3/04*
U.S. Cl. 18—4 B 10 Claims

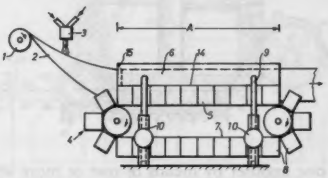


A machine for the manufacture of relatively thin sheetlike forms from a plastic material. A pair of belts is passed between a pair of mold members while having a charge of plastic material located between the belts to produce a desired form. The molds are brought together with the material and the belts located therebetween, at least one of the belts being employed to carry the material to, and away from, the mold members.

3,604,054
APPARATUS FOR MAKING SHAPED FOAM ARTICLES

Karl-Heinz Eisenmann, Ferdinand Proska, Bergisch Neukirchen, and Willi Schmitzer, Birlinghoven, all of, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen and Maschinenfabrik Hennecke GmbH, Leverkusen, Germany

Filed Nov. 26, 1969, Ser. No. 880,004
Claims priority, application Germany, Dec. 23, 1968, P 18 16 549.6
Int. Cl. B29d *9/00*, *27/04*; B29c *5/00*
U.S. Cl. 18—4 B 7 Claims

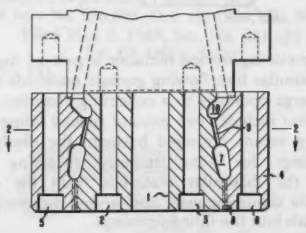


For the production of foamed rods an endless conveyor belt is used which carries the underpart of the foaming mold, while the upper part of the foaming mold is rigidly fixed above the conveyor belt.

3,604,055
EXTRUSION DIE

John A. McHardy, Ashawa, Ontario, and Thomas Urquhart, Whitby, Ontario, both of, Canada, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 5, 1969, Ser. No. 821,617
Int. Cl. B29f *3/00*
U.S. Cl. 18—12 N 1 Claim



Extrusion die for extruding plastic netting and consisting of inner and outer die members rotatable relative to each other and having surfaces defining die orifices wherein the surfaces of the die members having the die orifices are cylindrical and not in contact with each other, the mechanical thrust in the direction of the axis of the die being borne by frustoconical portions of the inner and outer die members.

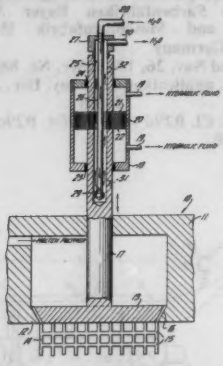
3,604,056
APPARATUS FOR PREVENTION OF SHAFT SEAL DEGRADATION

Ronald L. Larsen, Minneapolis, Minn., assignor to Conwed Corporation

Filed June 2, 1969, Ser. No. 829,354
Int. Cl. B29f *3/01*; F16j *15/16*
U.S. Cl. 18—12 N 7 Claims

A method and apparatus is provided for circulating a cooling medium through a cored shaft to preserve the life of the seals for the shaft in an extruder of the type used in the

production of plastic structures wherein a hot melt is extruded through cooperating die members which are moved



relative to one another by means of one or more shafts that tend to heat up and destroy the seals.

3,604,057

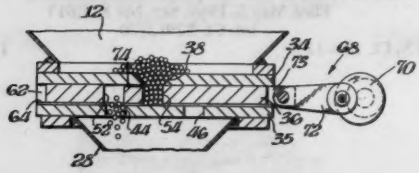
MIXING-METERING DEVICE FOR AN INJECTION MOLDING MACHINE

Frank S. Nixdorff, Jr., Baltimore, Md., assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed June 30, 1969, Ser. No. 837,610

Int. Cl. B29f *1/00*

U.S. Cl. 18—30 FH **15 Claims**



A mixing-metering device includes a pair of hoppers for supplying dissimilar free flowing granule materials through a pair of discharge openings to a collecting chamber. The collecting chamber includes two pairs of spaced filling openings with metering means arranged between the discharge and filling openings for simultaneously receiving metered amounts of the dissimilar materials from the discharge openings while simultaneously discharging metered amounts of the materials into the filling openings.

3,604,058

INJECTION MOLDING APPARATUS

Alfred Fischbach, Runderoth Colozne, AM Scheffert, Germany

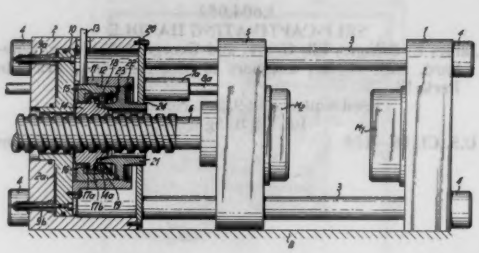
Filed Dec. 11, 1968, Ser. No. 782,838

Claims priority, application Germany, Dec. 22, 1967, P 17 29 160.0

Int. Cl. A43d *43/00*

U.S. Cl. 18—30 LA **24 Claims**

An injection molding apparatus wherein the platen which carries the movable mold section receives locking and sealing pressures by way of a spindle which meshes with a spindle nut. The latter is free to rotate during movement of the platen between open and closed positions but is held against rotation during application of locking and sealing pressures furnished by a piston which is reciprocable in a cylinder of the platen or in a cylinder provided in a stationary support. The spindle is rigid with the platen when the piston is mounted in the support or the spindle is rigid with the piston when the latter is mounted in the platen. The spindle nut rotates in response to rotation of the spindle if the threads of the spindle and spindle nut are not of the self-locking type. If



such threads are of the self-locking type, the spindle nut is rotated in response to displacement of the platen or by a separate prime mover.

3,604,059

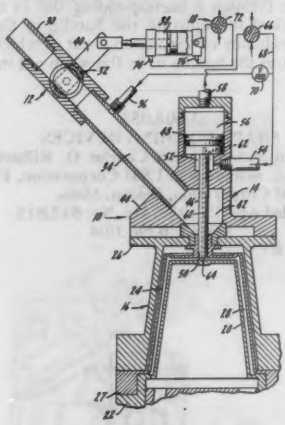
PRESSURE FILL SYSTEM

Stephen Liddell, Fort Worth, and Bill Matheson, Euless, both of, Tex., assignors to Crown Molding Co., Dallas, Tex.

Filed Feb. 6, 1969, Ser. No. 797,179

Int. Cl. B29d *27/04*

U.S. Cl. 18—5 P **4 Claims**



A pressure fill system for a molding machine used for making plastic cups and the like. A pressure chamber in the material supply conduit is provided with a valve which is opened to feed into a filler cavity and closed while the chamber is pressurized and the material conveyed into the mold cavity.

3,604,060

PRESS TOOL FOR MANUFACTURING ROD AND TUBES BY COMPRESSING POWDER

Hans Lundstrom, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebaget, Vasteras, Sweden

Filed Nov. 6, 1969, Ser. No. 874,474

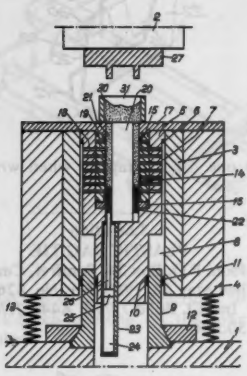
Claims priority, application Sweden, Nov. 14, 1968, 15430/68

Int. Cl. B30b *5/02, 11/00*

U.S. Cl. 18—5 H **3 Claims**

A press tool has an elongated mould cavity for the production of bodies by compression of powder enclosed in the mould cavity. The mould cavity is formed by an elastomeric sheath within a support cylinder arrangement which is mounted in a high pressure cylinder with a space therebetween. The interior of the support cylinder arrange-

ment communicates through lateral openings with such space. The space, which is filled with pressure fluid, has a narrow part opposite the openings and a larger part in which a compression piston is slidable. An ejection mechanism is composed of a cylinder having an eccentric bore turnably



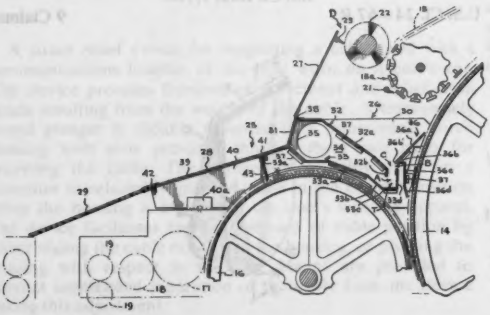
mounted beneath the mould cavity with a piston projecting therefrom, the position of which is radially adjustably by turning the cylinder. The device is placed between two relatively movable press parts, one of which carries a member which projects into the mould cavity while the other engages the compression piston.

3,604,061

APPARATUS FOR DELIVERY END CLEANING OF CARDING MACHINES

James F. King, Jr., Winston-Salem, N.C., assignor to The Bahnson Company, Winston-Salem, N.C.

Filed Dec. 26, 1968, Ser. No. 787,094
Int. Cl. D01g *15/76*
U.S. Cl. 19—107 **12 Claims**



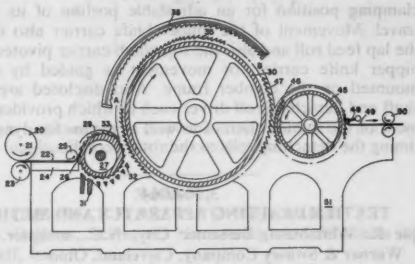
A suction manifold assembly for pneumatic cleaning of the delivery end section of a carding machine, including a plenum section forming a suction chamber overlying the doffer cylinder in open communication with the latter and with an adjacent portion of the main cylinder, and a hoodlike extension of hinged plural sections form other plenums overlying most of the other card components in the delivery end section. A baffle movable responsive to internal static pressure variations in the plenum section varies the amount of air admitted from the other plenums into the plenum section to maintain substantially constant internal static pressure in the latter. An air intake orifice is formed adjacent the flats chain at the delivery end bight to form air currents which sweep fibers from the flats clothing.

3,604,062

CARDING DEVICE

John D. Hollingsworth, P.O. Box 516, Greenville, S.C.

Continuation of application Ser. No. 869,300, Oct. 24, 1969, now abandoned , which is a continuation-in-part of application Ser. No. 793,715, Jan. 24, 1969, now abandoned , which is a continuation-in-part of application Ser. No. 729,068, May 14, 1968, now abandoned. This application Apr. 2, 1971, Ser. No. 130,619
Int. Cl. D01g *15/24*
U.S. Cl. 19—113 **2 Claims**



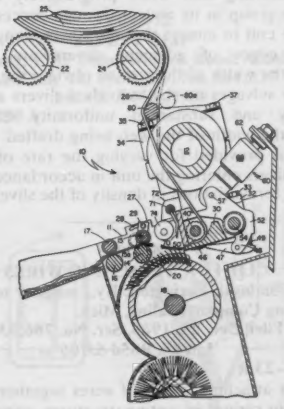
A device for improved carding having a concave support with a curvature corresponding to the curvature of a main cylinder includes a plurality of segments or bands of wire having a predetermined concave reverse curvature therein, so that sides opposite base portions of the bands face inwardly. A plurality of the reverse curved segments are positioned in adjacent rows in alignment on the support with teeth on the sides of the bands opposite the base portions facing inwardly. The segments are fastened on the support as by clamping. The segments have a curvature corresponding to the curvature of the concave support by virtue of a reverse set prior to being fastened on the support.

3,604,063

TEXTILE COMBER DETACHING ROLL DRIVE

John Clifford Von Kaenel; Gordon Campbell Anderson, and Stephen David Seymore, Jr., all of Clemson, S.C., assignors to Maremont Corporation, Chicago, Ill.

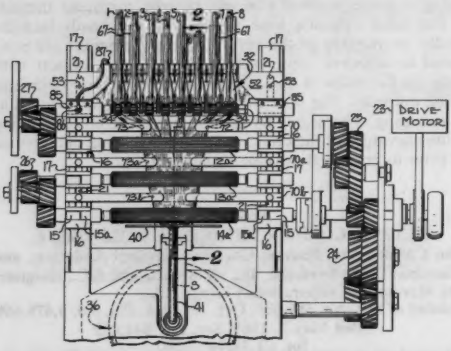
Division of Ser. No. 586,605, Oct. 10, 1966, Pat. No. 3,479,669. Filed May 2, 1969, Ser. No. 841,651
Int. Cl. D01g *19/20*
U.S. Cl. 19—231 **8 Claims**



A textile fiber comber of the type having an oscillating nipper shaft for oscillating the nipper mechanism adjacent to a rotary bottom comb, the so-called half-lap and to a top

comb, toward and away from a pair of detaching rolls. The nipper head mechanism disclosed, by the oscillating motion of its rock shaft produces all of the motions necessary for operating the nipper itself including its feed roll, the top comb, and the conversion of a uniform unrolling of the lap supply roll to the intermittent lap feed at the feed roll. The nipper cushion plate carrier is rigidly and directly mounted on the oscillating nipper shaft and has pivotally mounted on it the nipper knife carrier for movement of the nipper knife toward and away from the nipper edge. The nipper knife carrier is operated by an adjustable and resilient link connected to the comber frame so that the nipper knife remains in its clamping position for an adjustable portion of its path of travel. Movement of the nipper knife carrier also operates the lap feed roll and also the top comb carrier pivoted on the nipper knife carrier for movement as guided by a roller mounted on the comber frame. Also disclosed are nipper shaft and detaching roll drives each of which provides adjustment of the motion thereof as well as means for dynamically timing the detaching rolls to the rotary comb.

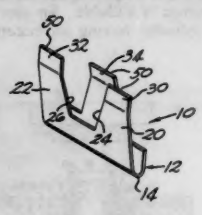
3,604,064
TEXTILE DRAFTING APPARATUS AND METHOD
Joe R. Whitehurst, Bessemer City, N.C., assignor to The Warner & Swasey Company, Cleveland, Ohio
Filed Oct. 21, 1968, Ser. No. 769,015
Int. Cl. D01h *5/50*
U.S. Cl. 19—282 **8 Claims**



A method of and apparatus for guiding a group of slivers through a drafting unit while progressively reducing the width of the group in its course through successive drafting zones of the unit to ensure that the fibers along the longitudinal side edges of adjacent slivers are intermingled throughout the width of the web to obviate the formation of feather-edge selvages on the individual slivers and to ensure homogeneity and substantial uniformity of the fibers throughout the width of the web being drafted. Also, evener roll means is provided for varying the rate of feed of the respective slivers entering the unit in accordance with, and to compensate for, variations in density of the slivers.

3,604,065
CLIP FOR ATTACHING WIRES
Walter V. Slominski, Lexington, Ky., assignor to Hoover Ball and Bearing Company, Saline, Mich.
Filed Dec. 23, 1968, Ser. No. 786,036
Int. Cl. B65d *63/06*
U.S. Cl. 24—23 R **6 Claims**

A clip for attaching a pair of wires together, such as the wires used for springs in seating structures, comprising a substantially U-shape body having an arcuate bight and a pair of substantially parallel legs arranged so that when the wires to be attached are disposed between the legs and nested in the bight, the legs can be wrapped in opposite directions about the wires so as to firmly hold the wires in side-by-side relation. At least one of the legs terminates in an inclined portion which extends generally toward the other leg in the direction

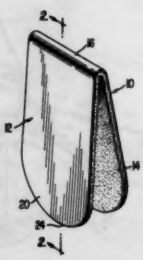


in which the one leg is wrapped when wrapped about the wires.

3,604,066
PLASTIC BAG TIE
Edward W. Moon, P.O. Box 24, Pomfret, Conn.
Filed May 22, 1969, Ser. No. 826,959
Int. Cl. B65d *77/10;* **A44b** *21/00*
U.S. Cl. 24—30.5 R **6 Claims**

A one-piece bag tie of resilient thermoplastic material has a portion for encircling the bag, and leg portions which can be easily twisted together for locking inner segments thereof to secure the bag in a closed condition.

3,604,067
CLIP STRUCTURE
Dwight C. Brown, 414 N. Granada St., Arlington, Va.
Continuation-in-part of application Ser. No. 815,101, Apr. 10, 1969, now abandoned. This application Aug. 12, 1969, Ser. No. 849,438
Int. Cl. B42f *1/100*
U.S. Cl. 24—67 R **9 Claims**

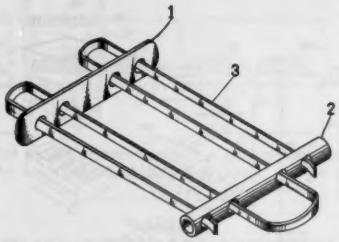


A clip structure having a strip of resilient and compressible material secured to one surface of a flat metal strip bent substantially in half. Crimps or corrugations can be made in the metal strip to increase the holding power of the clip structure.

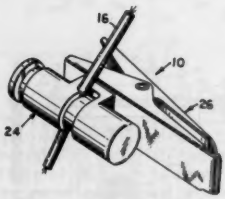
3,604,068
ADJUSTABLE ATTACHMENT
Hazel M. Stammen, 2730 Wood St., Sarasota, Fla.
Filed June 23, 1969, Ser. No. 835,494
Int. Cl. A44b *21/00*
U.S. Cl. 24—73 R **2 Claims**

A wrist attachment comprising an oblong and a tubular button having a plurality of aligned apertures two between

two others extending in the direction of the length of the buttons and two apertures are sized to the string in use and the two other apertures are sized a few fractions larger than the string plus a lock-catch opening on the lower button to create a safety feature.



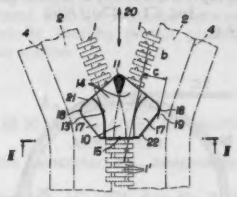
3,604,069
CABLE STRAIN RELIEF DEVICE
Wolfgang W. Jensen, Capitola, Calif., assignor to Pacific Plantronics, Inc., Santa Cruz, Calif.
Filed Apr. 1, 1970, Ser. No. 24,495
Int. Cl. A44b *21/00, 13/02*
U.S. Cl. 24—73 SH **6 Claims**



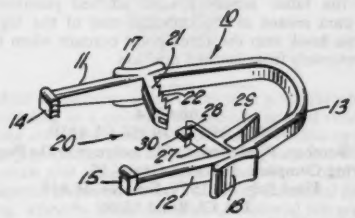
A strain relief device for supporting a cable used with a communications headset of the type worn on a user's ear. The device provides freedom of movement and relief from strain resulting from the weight of the cable. A transversely bored plunger is slidably mounted in a transversely bored housing with slots provided through these two parts for receiving the cable. The plunger is yieldably urged in a direction to releasably grip the cable in the desired position when the housing is clipped to the user's wearing apparel. The device facilitates rapid adjustment of cable position by either sliding the cable relative to the housing, or pivoting the housing with respect to the clip. Means are provided to prevent unintended separation of the cable from the device during this adjustment.

3,604,070
ZIP-FASTENER
Susanne Vorsteher, Vienna, Austria, assignor to Anba Sportmode Vorsteher K.G., Vienna, Austria
Filed Dec. 3, 1968, Ser. No. 780,853
Claims priority, application Austria, Dec. 14, 1967, A11291/67
Int. Cl. A44b *19/26*
U.S. Cl. 24—205.15 **2 Claims**

A slide fastener for engaging and disengaging two pieces of fabric having attached thereto interlocking fastener elements. The slide fastener has upper and lower cover plates forming guide channels therebetween for engaging and disengaging the fastener elements. A portion of the cover plates extend outwardly on each side of the longitudinal axis of the slider beyond the guide channel ending in curvilinear apexes. The curvilinear apexes are disposed approximately midway between longitudinal ends of the cover plates.

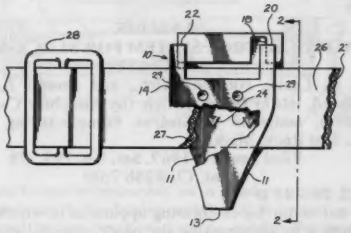


3,604,071
ONE-PIECE PLASTIC TOWEL CLAMP
Harry G. Reimels, Braintree, Mass., assignor to Codman & Shurtleff, Inc.
Filed July 25, 1969, Ser. No. 844,775
Int. Cl. A44b *21/00;* **A61b** *17/00*
U.S. Cl. 24—248 L **4 Claims**



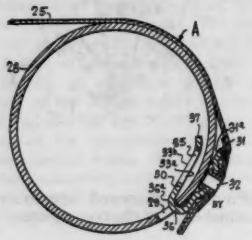
A one-piece molded plastic clamp having coacting jaws laterally offset from the ends of a pair of substantially straight arms that are integral with an arcuately shaped hinge portion. A mechanism comprising a rack and a locking hook is located between the arms for releasably maintaining the jaws in a clamping relationship.

3,604,072
SAFETY CLIP
William L. Posey, 1739 Meadowbrook Road, Altadena, Calif.
Filed July 14, 1969, Ser. No. 841,337
Int. Cl. A44b *21/00*
U.S. Cl. 24—259 A **12 Claims**



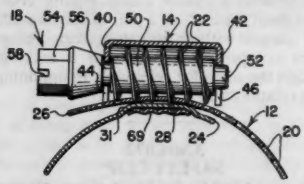
A U-shaped clip clamps straps together by gripping them between opposing walls of the clip.

3,604,073
RELEASABLE FASTENER ASSEMBLY FOR WEBBING MATERIALS
Harold Green, 171 S. Vista St., Los Angeles, Calif.
Filed Apr. 21, 1970, Ser. No. 30,388
Int. Cl. A47c 31/00
U.S. Cl. 24—265 C 8 Claims



A releasable self-retaining means for fastener assemblies employing a U-shaped spring hook for attaching a webbing material to a slotted or perforated frame. The self-retaining means consists of a three-point frictional contact produced between the hook legs and the frame in response to the spring resiliency and while the hook slides to and from latched position. Cam means at the free end of one of the hook legs initially guides the hook into the three-point contact as the latter moves toward latched position, and a second cam means at the opposite end of the leg initially guides the hook into the three-point contact when the hook moves reversely from latched position.

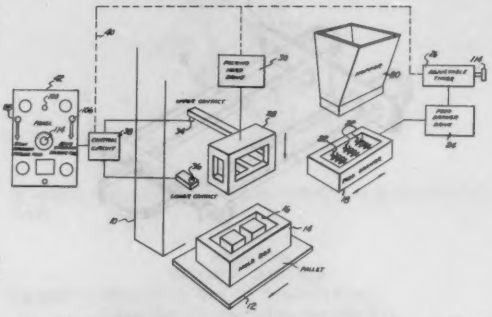
3,604,074
WORM DRIVE HOSE CLAMP
Irwin J. Bambas, Westchester, Ill., assignor to Du Page Manufacturing Company, Downers Grove, Ill.
Filed July 20, 1970, Ser. No. 56,615
Int. Cl. B65d 63/00
U.S. Cl. 24—274 R 3 Claims



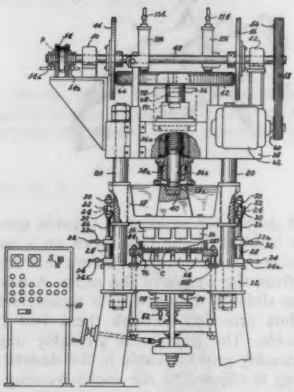
A worm drive hose clamp having a hose-engaging saddle which reinforces the worm housing and also offers frictional characteristics which prevents rotational slippage of the clamp during installation thereof on a hose connection.

3,604,075
DENSITY CONTROL SYSTEM FOR BLOCK-MAKING APPARATUS
Frank K. Locke, Hudson, Mich., and Russell J. Campbell, deceased, late of Detroit, Mich. (by Josephine Campbell, executrix), assignors to Stearns Manufacturing Company, Inc., Flat Rock, Mich.
Filed Jan. 27, 1969, Ser. No. 795,778
Int. Cl. B28b 7/00
U.S. Cl. 25—41 D 7 Claims

An automatic block-forming apparatus in which the blocks are formed by compressing the block material in a mold box until the material takes the shape of the mold cavity. The compression stroke is automatically timed and compared each cycle to a range of acceptable times that will result in a block having an acceptable density. If the compression time falls outside of the acceptable time range, a control circuit sounds an alarm and indicates whether more or less material must be fed into the mold box to either increase or reduce the density of the compressed blocks.



3,604,076
AUTOMATIC SCREW-OPERATED PRESS
Leonard Brown, and Foster B. Cooley, both of Trenton, N.J., assignors to Crossley Machine Company, Inc.
Filed Dec. 5, 1969, Ser. No. 882,564
Int. Cl. B28b 3/02
U.S. Cl. 25—42 7 Claims

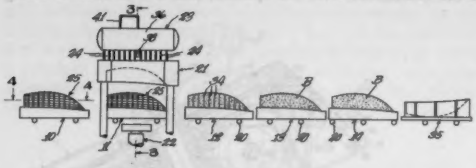


An automatic screw-operated press in which the ram is controlled in a "floating" condition independently of the screw by a pair of hydraulic cylinders, and in which the screw is operated by an air cylinder the piston of which is mounted on the shiftable disk shaft, the reciprocal "bumping" strokes of the screw being controlled by a pair of vertically spaced proximity switches actuated by a magnetic peripheral portion of the friction wheel.

3,604,077
APPARATUS FOR MAKING MOLDED BODIES
Richard L. Rath, Sr., Warren, Ohio, assignor to Sea Ferro, Inc., Fort Lauderdale, Fla.
Filed Dec. 18, 1968, Ser. No. 784,661
Int. Cl. B28b 7/02; B63b 5/16
U.S. Cl. 25—118 R 12 Claims

Methods of and apparatus for manufacturing thin-walled,

ferrocement bodies such as boat hulls by means of reusable,



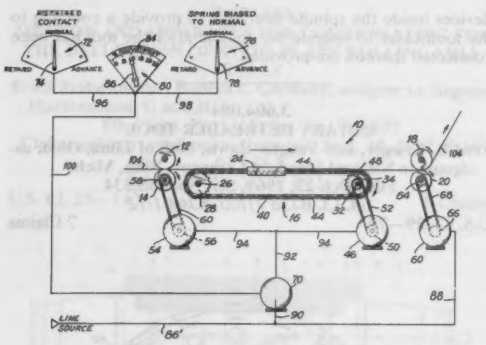
cooperable molds between which a cementitious mixture is injected by a novel pressurization device.

3,604,078

WEB FEED ADVANCE AND RETARD CONTROL MEANS

Joseph Sciola, 7 Cottage Lane, Upper Saddle River, N.J., and Gabor Nagy, 98 W. 1st St., Clifton, N.J.

Filed June 20, 1969, Ser. No. 842,424
Int. Cl. D06c *3/02*; **D06h** *3/12*
U.S. Cl. 26—51.3 **5 Claims**



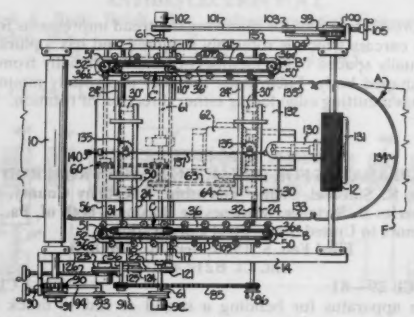
New and improved web feed advance and retard control means are provided and comprise means to retard or advance the feed rate of said web to correct for distortion of the latter, and means to indicate and adjust the extent of said feed rate increase or decrease.

3,604,079

APPARATUS FOR SPREADING AND COMPACTING TUBULAR FABRIC

Willis W. Coates, 1059 3rd St., Spencer, N.C.

Continuation-in-part of application Ser. No. 616,663, Feb. 16, 1967, now Patent No. 3,436,796, which is a continuation-in-part of application Ser. No. 552,058, May 23, 1966, now abandoned. This application Apr. 3, 1969, Ser. No. 813,251
Int. Cl. D06c *5/00, 21/00*
U.S. Cl. 26—55 **8 Claims**



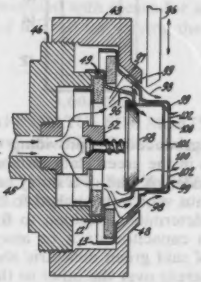
Pinwheels are supported on conveyor chains for movement along opposite sides of a spreader frame to aid in drawing the tubular fabric over the spreading frame with the pinwheels being held in a nonrotating position. Drive means is provided for rotating the pinwheels in a reverse direction from the direction of fabric travel to compact the fabric to the desired degree. Adjusting means is provided for varying the width of the spreader frame and the distance between the opposed sets of pinwheels to thereby permit processing of tubular fabrics of various widths.

3,604,080

METHOD FOR MAKING AN ELECTRON-TUBE GRID ASSEMBLY

Ira Eugene Smith, Lancaster, Pa., assignor to RCA Corporation

Filed Jan. 16, 1970, Ser. No. 3,299
Int. Cl. H01j *9/00*
U.S. Cl. 29—25.14 **5 Claims**



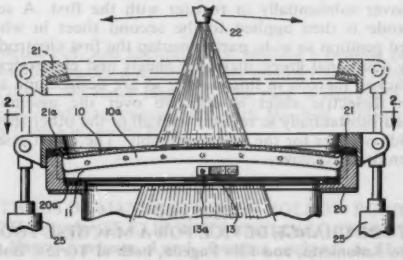
A method for making an electron tube grid assembly comprises mounting in a concentric, radially spaced relationship at least one set of a plurality of thin-walled hollow cylindrical electrode grid blanks, the blanks defining internal chambers therebetween and a central internal chamber. Then, radially aligned apertures are cut in the blanks by electrical discharge machining, whereby small particles of material are produced. The particles are flushed away from the cutting region by a continuous directed stream of fluid through each of the internal chambers and over the external surfaces at least in the cutting region.

3,604,081

SCREENING A COLOR CATHODE-RAY TUBE

Josef Moegenbier, Morton Grove, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

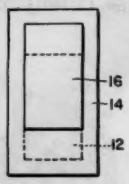
Filed June 4, 1969, Ser. No. 830,287
Int. Cl. H01j *9/16, 9/44*
U.S. Cl. 29—25.18 **3 Claims**



The mask/frame subassembly of a shadow mask type of color cathode-ray tube, having apertures of proper size for screening and having been oxidized to exhibit the heat-conducting and light-reflecting properties of a black body, is used as an exposure mask in photoprinting the dot triads of a mosaic-type screen for the tube. Thereafter, only the surface of the mask which faces the screen is subjected to a stripping step in which its oxide coating is removed. The mask/frame

subassembly is now reetched so that the holes thereof are made larger than the elemental phosphor deposits of the screen, as required in black surround and post-deflection-focus color tubes.

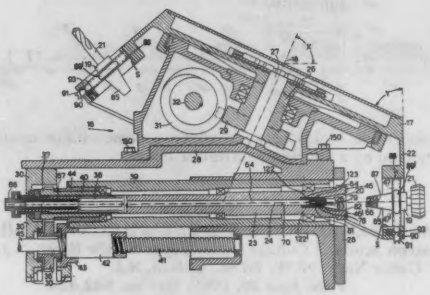
3,604,082
METHOD OF MAKING A CAPACITOR
Robert D. McBrayer; Forrest I. Peters, and Robert D. Smith, all of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.
Filed Oct. 30, 1968, Ser. No. 771,787
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.42 **31 Claims**



A capacitor produced by providing a plurality of thin dielectric sheets in the green state formed of a crystallizable glass frit in a binder. A film of a slurry or suspension of particulate metal in a vehicle is applied to two green dielectric sheets in a predetermined position to form capacitor electrodes. A green capacitor stack or assembly is formed by disposing one of said green dielectric sheets with said electrode applied thereto over the other so that the electrodes in part overlap each other. A third green dielectric sheet is disposed over the exposed electrode to form a cover for the electrode and the green capacitor assembly. The assembly so formed is placed on a pallet and subjected to a temperature sufficient to volatilize or burn out all of the organic constituents of the assembly. The temperature is then raised to soften the glass and pressure is applied to the assembly to coalesce and compact the glass, seal adjacent members together, and produce a substantially dense, void-free, monolithic structure. The assembly is then heat treated to crystallize the glass and form a glass-ceramic dielectric within which the electrodes are imbedded, after which the temperature and pressure are removed. The edge portions of the capacitor stack or assembly are then removed to expose the nonoverlapping ends of the electrodes which may thereafter be metallized and to which leads are attached. Capacitors may be formed with as many plates as are desired in the above manner, in which case alternate electrodes are in register with one another. In addition, a plurality of discrete capacitor units may be formed simultaneously in the above manner and thereafter separated after the glass is crystallized. Further, an electrode may be first applied to one green dielectric sheet and a second green dielectric sheet disposed thereover substantially in register with the first. A second electrode is then applied to the second sheet in which a shifted position so as to partly overlap the first electrode. As many additional green dielectric sheets and electrodes may be stacked thereon in this manner as are desired and a final green dielectric sheet is disposed over the assembly so formed substantially in register with all of the other sheets to provide a cover for the green assembly. The green assembly is then fired as above.

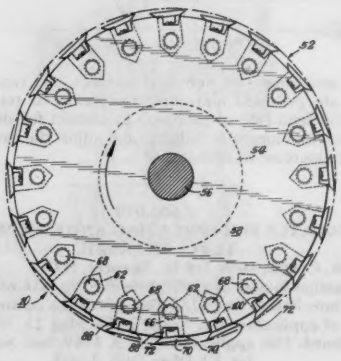
3,604,083
TOOL CHANGE DEVICE FOR A MACHINE TOOL
Bruno Antonietto, and Elio Pagella, both of Torino, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Torino), Italy
Filed July 29, 1968, Ser. No. 748,534
Claims priority, application Italy, June 29, 1967, 52600 A/67
Int. Cl. B23b *29/32;* **B23c** *5/26;* **B23q** *3/157*
U.S. Cl. 29—26 **2 Claims**

A machine tool with a device for effecting rapid tool changes comprising a frame carrying a rotatable spindle capable of being coupled to a tool through the intermediary of a toolholder to which the tool is secured. A mechanism for lining up the spindle, from whatever position it is in, to a predetermined angular setting in order to allow engagement of the toolholder with the spindle, and translational locking



devices inside the spindle operative to provide a coupling to the toolholder to operate the spindle after the tool has been connected thereto, are provided.

3,604,084
ROTARY DETREADER TOOL
Fred B. Krieger, and Vaughn Rawls, both of Lima, Ohio, assignors to National-Standard Company, Niles, Mich.
Filed Oct. 22, 1969, Ser. No. 868,534
Int. Cl. B23d *71/00;* **B26d** *1/12*
U.S. Cl. 29—78 **7 Claims**

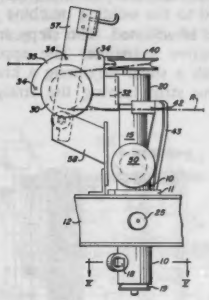


A tire-buffing tool for removing the tread impressions from a tire carcass which is rotatably mounted and has a plurality of equally spaced blade members extending radially from its disk-shaped body. Each blade member is pivotally mounted and has a cutting edge facing either direction of rotation.

3,604,085
APPARATUS FOR BREAKING SCALE FROM ROD
James R. Stoeckel, Shaler Township, Allegheny County, and Charles D. Stricker, Monroeville Borough, both of, Pa., assignors to United States Steel Corporation
Filed Feb. 5, 1969, Ser. No. 796,803
Int. Cl. B21c *43/04*
U.S. Cl. 29—81 **1 Claim**

An apparatus for bending a strand of rod to crack and loosen surface scale having two rotatable breaker sheaves around which the rod is bent. The breaker sheaves are aligned with their planes of rotation at right angles to each

other so that the strand is bent in two perpendicular planes to optimize scale cracking and loosening. A lifting mechanism is



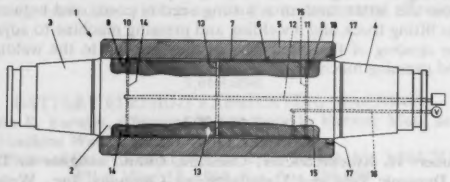
provided to lift the breaker sheaves away from their normal operating position to facilitate stringup.

3,604,086

METHOD AND APPARATUS FOR COMPENSATING FOR THE DEFLECTION OF STEEL PLATE ROLLING MILL ROLLS

Erich Bretschneider, Buderich, Germany, assignor to Siegener Machinenbau, G.m.b.H.

Filed Sept. 19, 1968, Ser. No. 760,897
Claims priority, application Germany, Sept. 29, 1967, P 16 02 155.9
Int. Cl. B21b *29/00;* **B02c** *4/30*
U.S. Cl. 29—113 **5 Claims**



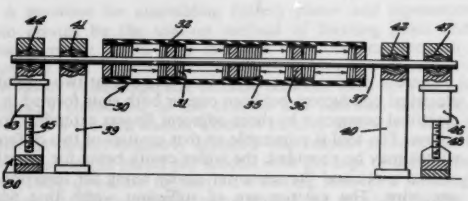
Disclosed is a crown-controlled roll for use in a rolling mill. The roll is constructed with a sleeve mounted on a mandrel having an axially located bore for transmitting a controlled pressurized fluid medium through radially extending bores into a gap between the mandrel and the sleeve. At each end of the mandrel distinct from the gap, peripheral seals are actuated by fluid transmitted radially from the axial bore. The roll sleeve is constructed with a thickness of approximately 0.15 of the outside diameter of the backup roll. Cams are used to rigidly interconnect the mandrel with the sleeve.

3,604,087

ANTIDEFLECTION ROLL

Ralph A. Beck, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Mar. 13, 1970, Ser. No. 19,313
Int. Cl. B21b *31/08*
U.S. Cl. 29—127 **11 Claims**



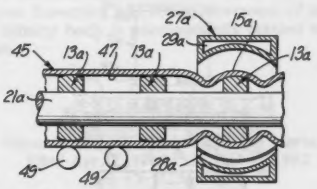
A roll for supporting a moving web includes a helical spring covered by a flexible outer shell to provide for curvature of the roll which may be preset to compensate for deflections of the roll. The roll has an inner core or shaft construction which includes an elongate shaft extending through a plurality of spaced-apart annular flanges each of which includes a groove at the same lead angle as the lead angle of the helical spring for threadedly engaging the turns of the spring and aiding in fabrication of the roll. The shaft may be supported in an antideflection mode of operation by securing the end thereof for rotation in spherical bearings and providing means at the distal ends of the shaft for imparting a selected deflection to the shaft. The roll may also be configured as a bowed roll by providing a nonrotational fulcrum for the shaft at each end of the roll and by providing means at each distal end of the roll for imparting bowing forces to the roll. In this configuration, the flanges which connect the shaft to the flexible portion of the roll are provided as bearings with the central portions of flanges forming a bearing race to be secured to the shaft and the outer portions of the flange forming an outer bearing race for threaded engagement with the helical spring. As a bowed roll the apparatus is further provided with means for adjusting the supporting apparatus of the roll for varying the plane of deflection.

3,604,088

METHOD AND APPARATUS FOR MAKING BEARINGS

Peter H. Turner, Granada Hills, Calif., assignor to Sargent Industries, Inc., Burbank, Calif.

Filed Dec. 16, 1969, Ser. No. 885,458
Int. Cl. B23p *11/00, 17/00, 19/00*
U.S. Cl. 29—149.5 B **13 Claims**



A method of, and apparatus for, making a bearing of the type which includes a ball-like inner member and a race circumscribing the inner member. The race is deformed into cooperative sliding engagement with the ball utilizing the energy from a magnetic field.

3,604,089

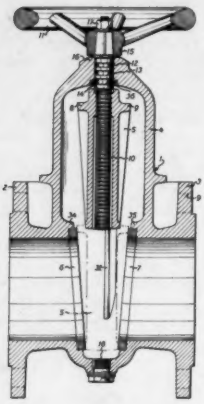
METHODS OF MANUFACTURING HOLLOW BODIES WITH SEPARATE ELEMENTS ENCLOSED THEREIN

Frans Harry Karlsson, Lund, Sweden, assignor to Hykon-Patent Aktiebolag, Lund, Sweden

Filed Apr. 1, 1969, Ser. No. 812,160
Claims priority, application Sweden, Apr. 10, 1968, 4825/68
Int. Cl. B21d *53/00;* **B21k** *29/00;* **B23p** *15/26*
U.S. Cl. 29—157.1 **6 Claims**

In a method of manufacturing in one piece a hollow body which is to accommodate in a hollow space thereof one or more separate elements which cannot possibly, or only with difficulty, be mounted in the body without division thereof,

the separate elements are enclosed in a core and the body is then shaped in one piece on the core by casting or otherwise,



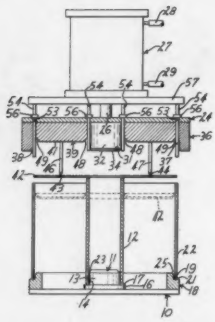
whereupon the core is removed so that the separate means are uncovered in the hollow space in the body.

3,604,090

PROCESS AND APPARATUS FOR PLACING SPACER BETWEEN HUB AND DRUM MEMBERS

Clinton R. Lake, Hartselle, Ala., assignor to Metco, Incorporated

Filed Jan. 22, 1970, Ser. No. 5,003
Int. Cl. B21d *53/26;* **B23p** *19/00*
U.S. Cl. 29—159 R **7 Claims**



Process and apparatus placing spacer between concentric hub and drum of spool in which one end of hub and drum are supported and retained concentric. Hub rounding and holding die moved into other end of hub and drum rounding and holding die moved into engagement with outer surface of other end of drum retaining outer surface of drum concentric with inner surface of hub while spacer forced inwardly between said other end of hub and said other end of drum.

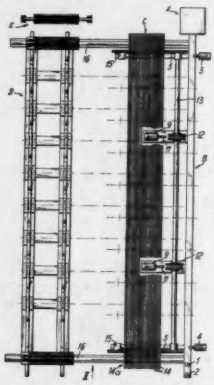
3,604,091

METHOD AND APPARATUS FOR CHARGING A WELDING MACHINE FOR LIGHT BEAM GRATINGS

Hans H. Martin, 4424 Westfalen Arfkamp 14, Stadtlohn, Germany

Filed July 10, 1969, Ser. No. 840,791
Int. Cl. B23q *3/00*
U.S. Cl. 29—200 A **19 Claims**

A continuous supporting bar strip is fed through a straightening machine and cut to the proper supporting bar lengths which are fed to a magazine. The number of supporting bars requisite for a selected size grating are lifted from the magazine and the height of the top surfaces of the lifted bars is adjusted to the level of the welding machine. The lifted bars are fed to the welding machine while the spacing of the lifted bars is adjusted. The steps are performed in a continuous repetitive sequence. The apparatus includes a support table with a shear adjoining a known straightening machine, and the strip leaving the straightening machine



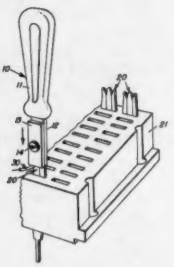
operates a first limit switch to stop the straightening machine and then operates a second limit switch to activate the shear to cut a bar length. A lifting truck cooperates with the supporting bar magazine to lift the requisite number of strips from the latter, and an adjusting reed is positioned between the lifting truck and a welding and pressing machine to adjust the spacing of the lifted bars as they are fed to the welding and pressing machine.

3,604,092

CONNECTING TOOL

Robert H. Knickerbocker, Cheshire, Conn., assignor to The Dynamic Tool and Manufacturing Company, Inc., Watertown, Conn.

Filed Oct. 27, 1969, Ser. No. 869,730
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 H **1 Claim**



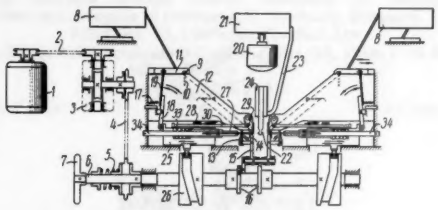
There is disclosed a tool for inserting one or two insulated electrical conductors between one or both slots formed in an electrical connector by three adjacent fingers extending from a base. The tool is adjustable so that cavities of two different widths may be provided, the wider cavity being for insertion of two wires and the narrower cavity being for insertion of one wire. The cavities are of sufficient width that when pushed down over the top of the three adjacent fingers of an electrical conductor, the inner walls of the cavity contact the outer edges of the electrical connector.

3,604,093

DEVICE FOR ASSEMBLING RADIO PARTS WITH AXIALLY EXTENDING WIRE LEADOUTS

Alexel Semenovich Amelchenko, Varshavskaya ulitsa, 58, kv. 37, Lenningrad, U.S.S.R.

Filed Aug. 5, 1969, Ser. No. 847,604
Int. Cl. H01r
U.S. Cl. 29—203 1 Claim



A device for assembling radio parts or similar electronic components having axial wire leadouts, designed mainly for manufacturing miniature radio parts.

The device comprises a distributing shaft, a mechanism adapted for feeding caps with wire leadouts into moveable punches arranged one opposite the other, said punches each having a cylindrical socket and a through opening extending along the punch axis and coaxial with said socket. In order to provide for the setting of one of said caps with wire leadouts into said cylindrical socket, a lock is placed in the path of each punch, said lock being operated from a common driving shaft, and a mechanism adapted for feeding ceramic bases delivers the latter to the place of assembly.

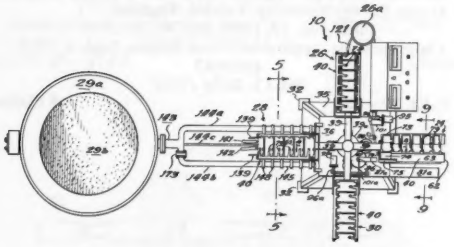
The device facilitates a high-quality assembly of radio parts having small geometric sizes, at a low percentage of rejection.

3,604,094

BATTERY ELEMENT FABRICATING MACHINES

John E. Farmer, Chicago, Ill., assignor to Farmer Mold and Machine Works, Inc.

Division of Ser. No. 650,119, June 29, 1967, Pat. No. 3,504,731.
Filed Mar. 13, 1969, Ser. No. 835,830
Int. Cl. H01m *35/08*
U.S. Cl. 29—204 8 Claims



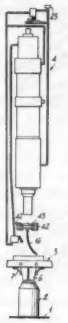
A machine for assembling battery plates and separators into groups by the cast-on method of forming posts and straps on the plates. The machine has a central vertically movable and rotatable column with a plurality of radially outwardly extending plate holding baskets, each of which is rotatably connected to the column and movable therewith between a loading station wherein battery plates are loaded with the basket angularly oriented with respect to horizontal and wherein the plates are loaded with the lugs of the plates projecting upwardly therefrom; a fluxing station; a molding station wherein particular valve means are provided to permit rapid and accurate flow of molten lead into cavities for the formation of battery posts and straps on the lugs of the plate; and an unloading station.

3,604,095

APPARATUS FOR PLACING TUBE STOCK MOUNTED VALVES ON AEROSOL CONTAINERS

Giancarlo Giuffredi, Milan, Italy, assignor to Coster Technologie Speciali S.p.A., Milan, Italy

Filed Mar. 3, 1969, Ser. No. 803,577
Claims priority, application Italy, Jan. 2, 1969, 836362
Int. Cl. B23p *19/04*
U.S. Cl. 29—208 B 9 Claims



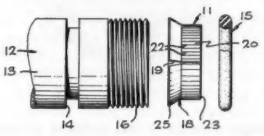
Apparatus for automatically applying tube stock mounted valves on aerosol containers. The apparatus comprises a sucking member gripping and lifting one valve at a time off of a valve feeding device, a tubular body lowering on the valve held by said member overlying its tube stock. A funnel-shaped element, on the major section end of which the lower end of the tubular body rests at the end of its downward stroke, and a rigid platform on which the containers rest with the inlet thereof just below the minor section end of the funnel element. After the tubular body has overlain the valve tube stock, also the valve retaining member lowers on said funnel element causing the tube stock to penetrate into the container and placing the valve on the inlet of said container. Then, said member and said tubular body move up again to rest position. Lowering and lifting movement of said member and said tubular body is pneumatically carried out by compressed air.

3,604,096

SEAL RING APPLICATOR

Yoshiaki Shiroma, 840 W. Maripasa, Santa Maria, Calif.

Filed Apr. 7, 1969, Ser. No. 813,962
Int. Cl. B23p *19/08*
U.S. Cl. 29—235 1 Claim



A generally round, axially parted, thin-walled device with a substantially cylindrical section optionally interrupted by axial slits upon which to mount the seal and a flared frustoconical section at one end thereof.

3,604,097

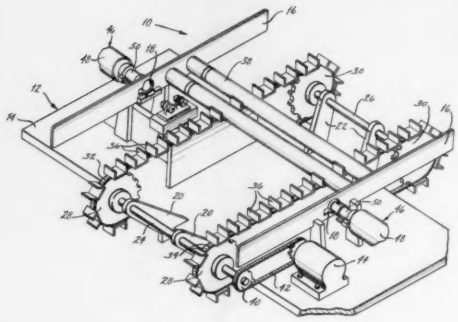
METHOD AND MEANS FOR SHAPING ROCKET LAUNCHER TUBES

John J. Nash, Ferguson, Mo., assignor to Alsco, Inc., St. Louis, Mo.

Filed Aug. 11, 1969, Ser. No. 849,071
Int. Cl. B23p *17/00, 19/00, 13/04*
U.S. Cl. 29—400 15 Claims

A means for shaping rocket launcher tubes includes first and second tool assemblies mounted on a frame and spaced

apart from one another and a conveyor adapted to move a cylindrical rocket launcher tube between the tool assemblies. The tool assemblies each include an extensible rotating drum, and an extensible cutting tool. The rotating drums are adapted to extend toward the opposite ends of the tube, and they include feet which are radially extendable to grip the



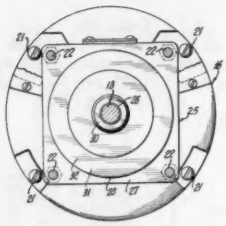
ends of the tube to impart rotational movement thereto. The cutting tools are adapted for moving to engage and cut the outer surface of the tube at its opposite ends while it is rotating. A scoring tool is mounted on the frame and includes at least one roller which is adapted to be pressed against the surface of the tube as it rotates so as to cause an indentation around the circumference of the tube.

3,604,098

METHOD OF SERVICING A PUMP UNIT

Irwin C. Goldberg, 171 Whitman Drive, Brooklyn, N.Y.

Division of Ser. No. 675,924, Oct. 17, 1967, Pat. No. 3,527,464.
Filed Nov. 25, 1969, Ser. No. 879,868
Int. Cl. B22d *19/10*; **B23p** *7/00*
U.S. Cl. 29—401 **2 Claims**



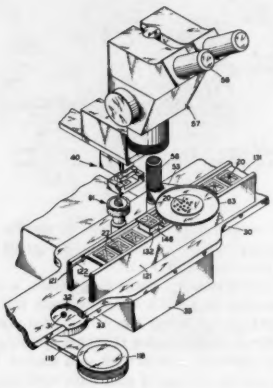
The disclosure relates to the method of servicing a pump unit and providing a new sealing surface for a bearing bracket of a motor driven impeller shaft of a centrifugal pump which is connected to an open end of a pump body containing an impeller. Separating the pump body from the bearing bracket and removing a rotatable sealing device carried by the shaft and normally engaging with a sealing surface on the end wall of the bearing bracket. Then covering the end wall of the bearing bracket and the sealing surface thereon with a shield plate having an opening through which the impeller shaft extends and an annular section surrounding said opening which defines a sealing surface. Securing the shield plate between the end wall of the bearing bracket and the pump body and installing on the impeller shaft a rotatable sealing device with an annular sealing member thereof seated in the annular section of the shield plate and with an annular surface of the sealing member being in sealing engagement with the sealing surface provided by the shield plate.

3,604,099

METHODS OF AND APPARATUS FOR BONDING LEADED DEVICES TO SUBSTRATES

Fred J. Schneider, Catasauqua, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 724,380, Apr. 26, 1968, Pat. No. 3,477,630.
Filed Aug. 18, 1969, Ser. No. 850,945
Int. Cl. B23p *19/00, 19/04*
U.S. Cl. 29—429 **3 Claims**



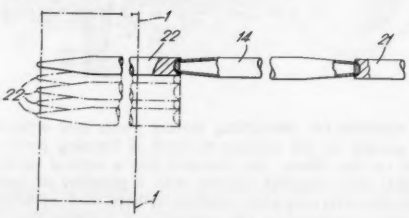
Methods of and apparatus for aligning a first article, such as a beam-lead integrated circuit, supported on a pivotally mounted tray with a reference image, and then operating a bonding head to pick up the circuit at an assembled position. The tray and bonding head are moved away from the assembly position and a conveyor is indexed to move a second article, such as a substrate, on a workholder beneath the bonding head. The workholder is lifted out of a nest in the conveyor and elevated to a bonding level where the substrate is aligned with the reference image after which the head is actuated to bond the beam-lead integrated circuit to the substrate.

3,604,100

METHODS OF INSERTING RODS INTO A FRAME

John Basil Tindale, Reading, and James Henry Burgess, Silchester, both of, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 19, 1968, Ser. No. 753,574
Claims priority, application Great Britain, Sept. 6, 1967, 40820/67
Int. Cl. B23p *19/04*
U.S. Cl. 29—433 **5 Claims**



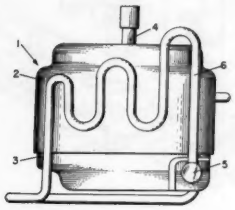
To insert a parallel array of nuclear fuel pins into a wrapper containing transverse grids for locating the pins, the wrapper is first filled with pilot rods of reduced diameter and having tapered leading ends to allow easy passage through the grids. Next the recessed rear ends of the pilot pins are engaged by the front ends of the fuel pins and the latter thrust into the wrapper so that they displace the pilot rods.

Successive rows of fuel pins are thrust into the wrapper by apparatus comprising a plurality of resiliently mounted, grooved roller pairs which locate a row of fuel pins between them, the rear ends of the pins being engaged by a thrust-head which passes between the rollers of each pair.

3,604,101
CONNECTION BETWEEN SHEET-METAL SOUND-ABSORBER AND A PIPE

Bent Melchior Karlsen Holme, Humbaek Pr. Skovby, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Oct. 10, 1969, Ser. No. 865,249
Claims priority, application Germany, Oct. 10, 1968, P 18 03 794.0
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.7 **5 Claims**

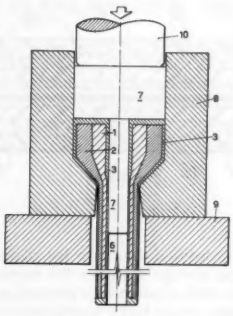


The invention relates to a method for making a connection between a pressure pipe and a sheet metal panel of a refrigeration unit pressure sound-absorber. The connection includes a first annularly shaped part soldered to the sheet metal panel. A second part having intersecting right-angle passages has the pressure pipe soldered thereto in alignment with one of the passages. The two parts are then joined by resistance pressure-welding and the pressure pipe is thereafter bent to a desired shape and welded into position relative to the sound absorber.

3,604,102
PROCESS FOR EFFECTING METALLURGICAL JOINTS BETWEEN TWO DIFFERENT METALS AND THE PRODUCTS OBTAINED THEREBY

Mario Boccalari, Saluggia, Vercelli, Italy; Gianfranco Colombi, Rome, Italy; Mario Gabaglio, Turin, Italy; Aldo Liscia, Turin, Italy, and John M. Siergiej, Wayland, Mass., assignors to Comitato Nazionale Per L'Energia Nucleare, Rome, Italy

Filed Dec. 24, 1968, Ser. No. 786,669
Claims priority, application Italy, Oct. 15, 1968, 827,962
Int. Cl. B21d *31/04*
U.S. Cl. 29—474.3 **14 Claims**



A method of producing tubular joints by a metallurgical bond wherein two tubular masses of different metals are placed one within the other; their facing surfaces are machined to facilitate the bond and then the bond is carried out by extrusion. The composite extruded tube is subjected to a forming operation, and is then machined and finished.

3,604,103
METHOD OF CLADDING METALS AND COMPOSITES THEREOF

John Bonchak, McKees Rocks, Pa., and Leonard M. Bianchi, Cleveland, Ohio, assignors to Cyclops Corporation, Universal Cyclops Specialty Steel Division, Bridgeville, Pa.

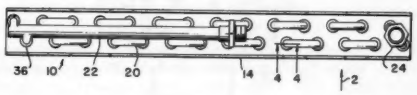
Filed Mar. 30, 1966, Ser. No. 538,538
Int. Cl. B23k *31/02*
U.S. Cl. 29—472.3 **10 Claims**

A method of forming an integral metallurgical composite of dissimilar metals one of which is a refractory metal comprising covering the refractory metal with at least one other metal to form a pack, heating the pack and rolling the pack, the heating and rolling being carried out in an essentially inert atmosphere, preferably high purity argon, for a time and at a temperature conducive to achieving a diffusion bond between the metals and the desired combination of mechanical and physical properties of the composite.

3,604,104
METHOD OF PRODUCING ALUMINUM BRAZED COIL

Paul H. Glasgow, 1159 W. Maumee St., Adrian, Mich.

Filed Feb. 26, 1969, Ser. No. 802,433
Int. Cl. B23k *31/02*
U.S. Cl. 29—487 **4 Claims**



A method of producing an all-aluminum coil is disclosed. In accordance with the method disclosed, hairpin coil tubes and coil fins are assembled with headers, return bends and inlet and outlet tubes. The ends of the hairpin tubes are expanded to receive the return tube portions with a predetermined clearance and the tubes are loaded with a solder ring at the expanded ends thereof. The fins are provided with solder-clad spacing collars around openings therethrough through which the hairpin tubes extend. The hairpin tubes are then expanded to mechanically secure the fin collars to the hairpin tubes. The assembled coil is then placed in a preheat oven and preheated to approximately 1,000° F. to bring the solder to a buttery consistency, after which the preheated coil assembly is immersed in molten Barium chloride salt at approximately 1,100° F. so that the solder rings and cladding on the collars braze the tubes and fins together. The brazed coil assembly is then washed in a hot ammonia bath. Sodium fluoride and lithium chloride fluxes are added to the salt bath to prevent oxidation of the coil components and to control the melting point of the salt bath, respectively.

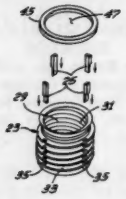
3,604,105
SEAL ASSEMBLY FOR THREADED PARTS AND METHOD

Ernest Heyworth, Fullerton, Calif., assignor to Fridair Industries, Redondo Beach, Calif.

Filed May 16, 1969, Ser. No. 825,187
Int. Cl. B21d *39/00*; **B23p** *11/00*
U.S. Cl. 29—520 **3 Claims**

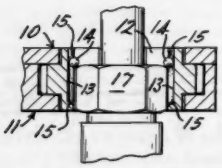
This disclosure describes an internally and an externally threaded member with an annular groove in the face of the internally threaded member. A deformable member is positioned in generally confronting relationship with the groove and the two threaded members are threaded together with

the deformable member being axially compressed therebetween to cold flow the material thereof into the



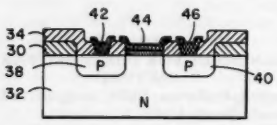
groove. Such cold flow of the deformable material causes a tight seal to be formed between the two members.

3,604,106
FASTENER RETAINER
John A. Borries, Chesterland, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.
Filed Mar. 27, 1970, Ser. No. 23,417
Int. Cl. B25b *13/00, 13/02*
U.S. Cl. 29—526 **5 Claims**



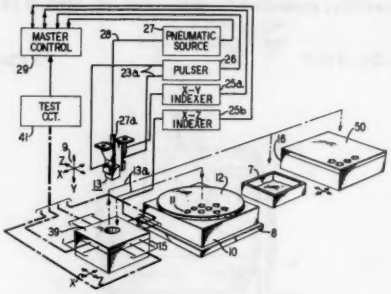
A fastener retainer for positioning open-socketed wrenches and the like upon a fastener. The retainer includes captive grooves extending across the width of the interior surface of a wrench-gripping member. Each groove retains for longitudinal movement between two slide-limit stops a bearing which protrudes from the open face of the groove inwardly from the interior surface of the wrench-gripping member. When a fastener is received axially from either side of the wrench-gripping member, the protruding bearings contact and move ahead of the fastener until forced against a slide-limit stop. The wrench is thereby held in position with a substantial portion of its socket depth in contact with the periphery of the fastener.

3,604,107
DOPED OXIDE FIELD EFFECT TRANSISTORS
John R. Fassett, Irvine, Calif., assignor to Collins Radio Company, Dallas, Tex.
Filed Apr. 17, 1969, Ser. No. 817,129
Int. Cl. B01j *17/00;* **H01g** *13/00*
U.S. Cl. 29—571 **7 Claims**



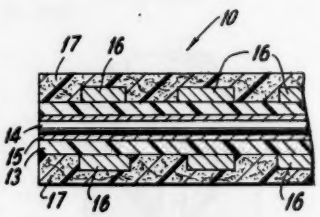
Disclosed is a method of making a field effect transistor with an accurately aligned gate by forming the source and drain regions from a doped layer on the substrate surface. The resulting transistor has reduced internal capacitance and improved speed characteristics.

3,604,108
METHOD FOR HANDLING, TESTING AND BONDING OF BEAM-LEADED DEVICES
Paul Mallery, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Oct. 7, 1969, Ser. No. 864,367
Int. Cl. G01r *3/00*
U.S. Cl. 29—593 **6 Claims**



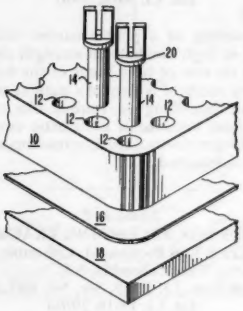
Beam-leaded devices are handles at and after a test stage by a precision movement system requiring only a single pickup of each device from its position as received. A pickup tool is brought in contact with the beam leads of successive devices and pulse-heated to melt the carrier wax and effect a tack bond of the head and leads. Without disturbing the device alignment, the head transfers the device to a prepositioned test station where full dynamic testing occurs. Thereafter, the head moves the device to a carrier, a substrate for bonding or a discard bin.

3,604,109
METHOD OF MAKING HORSESHOE-SHAPED KEEPERED WORD-LINE STRUCTURE FOR MEMORY PLANES
David J. Crimmins, Stockton, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Nov. 17, 1969, Ser. No. 877,347
Int. Cl. H01f *7/06*
U.S. Cl. 29—604 **6 Claims**



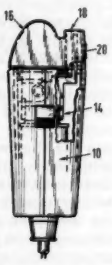
A keepered word-line structure for plated wire and thin film information storage matrices for memories having optimum magnetic field containment properties. Word-lines are formed on a base which has a significantly large amount by weight of a ferrite type material embedded into and covering both sides of a porous, reinforcing, dimensionally stable material, after which the word-lines are "flushed" with a ferrite mixture whereby each word-line is in intimate contact with, and surrounded on three sides by, the keeper material.

3,604,110
METHOD OF MAKING AN ELECTRICAL TERMINAL BOARD ASSEMBLY
Russell E. Jerolamon, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed Jan. 23, 1969, Ser. No. 793,263
Int. Cl. H05k 3/30
U.S. Cl. 29—626 5 Claims



A method of forming a terminal board assembly which comprises the steps of inserting the anchoring parts or pins of electrical accessories or components into holes opening out on one side of an apertured board composed of electrical insulating material and so dimensioned that the inserted ends of the pins are projected beyond the opposite side of the board. Placing a thin imperforate sheet of thermosetting plastic material in juxtaposition to the side of the apertured board from which the pins project. Then applying pressure compressing the plastic sheet against the adjacent side of the board thereby causing the projecting ends of the pins to punch out apertures in the plastic sheet corresponding in size and in registration with the apparatus of the board. Thereafter, subjecting the assembly to a high-temperature environment which first causes the plastic material of the sheet to liquify and flow into the annular spaces between the component pins and the walls of the holes into which they are inserted and then later causes this plastic material to polymerize or harden therein, thereby firmly securing the pins and their associated components to the insulating board.

3,604,111
ELECTRIC SHAVER
Richard Antretter, 8031 Karl Stielerstrasse, Stockdorf, near Munich, Germany
Filed Jan. 17, 1969, Ser. No. 791,962
Claims priority, application Germany, Feb. 1, 1968, P 16 78 178.5
Int. Cl. B26b 19/06, 19/10, 19/38
U.S. Cl. 30—34.1 25 Claims

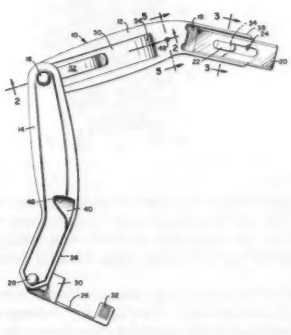


A cutter head housing is detachably secured to a body housing. A shorthair cutter head is covered by said cutter head housing and comprises a part-cylindrical screen, which is carried by said cutter head housing, and a set of knife blades, which conform to and contact said screen and are movable along the axis of the screen. A longhair cutter head is covered by said cutter head housing and disposed laterally beside said shorthair cutter head and comprises an outer comb and a shear comb. which contacts the outer comb and is guided by the latter for movement along the same. The longhair cutter head is detachably connected to said body housing. The arrangement is such that the longhair cutter head is removable as a unit from the cutter head housing when the same is connected to the body housing. Drive means are operable to drive said set of blades and the shear comb and comprise a motor, accommodated in said body housing and having an oscillating armature, and power-transmitting means operatively connecting said armature to the shear comb and arranged to disengage said longhair cutter head as the same is removed from said body housing.

3,604,112
METHOD AND APPARATUS FOR HAIR CUTTING
Krishin H. Bhavnani, 46 Rockland Place, Newton, Mass.
Filed Apr. 29, 1969, Ser. No. 820,159
Int. Cl. B26b 19/20
U.S. Cl. 30—200 7 Claims

A rotary-blade cutter is combined with an eccentric comb member having rows of teeth, the teeth being made of varying lengths to provide an eccentric effect. The cutter blades when rotated at high speed engage and cut hair ends which are caused to extend through slots in the cutter body. The eccentric comb arrangement operates to provide a variable spacing of the cutting device with respect to the scalp area so that a graduated hair-cutting operation can be efficiently carried out and a desirable trimming effect may be realized.

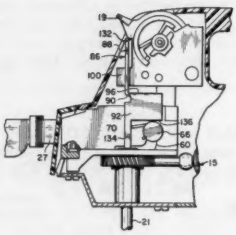
3,604,113
KNIFE
John F. Cuscovitch, 42 Woodbridge Ave., East Hartford, Conn.
Filed June 4, 1969, Ser. No. 830,309
Int. Cl. B26b 1/02
U.S. Cl. 30—331 7 Claims



A knife is presented having a removable blade housed in a body which is composed of two pivotally mounted segments. A pivot arm with a locking cam element is mounted on one of the body segments, and a removable blade is mounted on a loop on the other of the body segments. In the operating

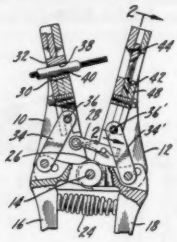
condition of the knife, the cam of the pivot arm engages the loop to simultaneously lock the body segments together and to also secure the blade in a desired position.

3,604,114
ELECTRICAL MIXER-KNIFE
Roy L. Swanke, Newington; Gordon H. Raymond, Southington, and Harvey Levine, Fairfield, all of, Conn., assignors to Dynamics Corporation of America, New York, N.Y.
Filed Dec. 12, 1968, Ser. No. 783,260
Int. Cl. B26b *7/00*
U.S. Cl. 30—272 **8 Claims**



A switch controlled electric hand mixer reciprocates releasable dual knives and rotates releasable dual beaters through a short motor shaft worm gear driving three worm wheels having substantially coplanar axes. The switch can be left in "ON" position when the beaters are present for mixing operations, but it turns "OFF" automatically if the switch is not manually held "ON" when the knives are in operative position. The beaters and knives, both are releasable for gravity withdrawal and cleaning by lost motion action of the switch in its "OFF" position.

3,604,115
PRECISION STRIPPER BLADE
Harrison M. McDonald, De Kalb, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.
Continuation-in-part of application Ser. No. 622,546, Mar. 13, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 584,399, Oct. 5, 1966, now Patent No. 3,416,227. This application Aug. 15, 1969, Ser. No. 854,352
Int. Cl. B26b *17/04*
U.S. Cl. 30—348 **3 Claims**



A stripper blade for use in removing the insulation from one end of an insulated wire and having a cutting knife mounted in an integrally molded supporting structure; the cutting knife has a cutting edge formed with a plurality of notches.

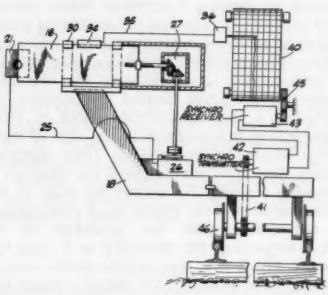
A method of fabricating stripper blades having the steps of forming a cutting knife, inserting the cutting knife in a mold cavity, inserting mold material into the mold cavity, solidifying the mold material, and ejecting the molded stripper blade from the mold cavity.

A mold for use in fabricating stripper blades and having a mold bottom, a mold cover and removable knockout pins adapted to close in registry to form a mold cavity having the contour of the desired molded stripper blade; one removable knockout pin contains molding means and a groove adapted to receive a cutting knife and align the cutting knife in cooperation with registry and alignment pins formed in the mold cover and bottom.

3,604,116
DENTAL IMPRESSION WAFER
Harry Shpuntoff, 40-49 74th St., Jackson Heights, N.Y.
Filed Jan. 8, 1970, Ser. No. 1,545
Int. Cl. A61c *9/00*
U.S. Cl. 32—19 **7 Claims**

A wafer consisting of a plastic carrier foil thinner than 0.020 mm. and of high mechanical strength and a coating of impression wax on one or both faces of the foil can be compressed between teeth of a dentist's patient under high bite pressure without disturbing the normal bite of any tooth in the patient's mouth because of the elastic compressibility of the periodontal membranes. The impressions obtained in the wafer thus are undistorted.

3,604,117
APPARATUS FOR RECORDING TRACK ERRORS
Helmuth Rolf Erich Von Beckmann, Columbia, S.C., assignor to Tamper, Inc., West Columbia, S.C.
Filed Mar. 13, 1969, Ser. No. 807,015
Int. Cl. E01b *29/04*
U.S. Cl. 33—60 **4 Claims**



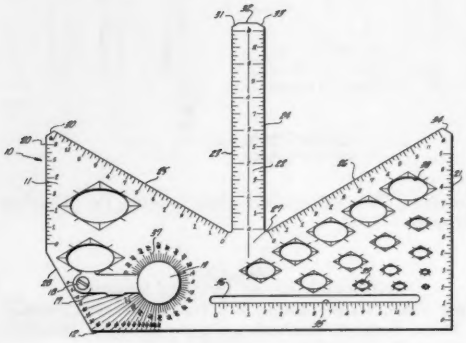
This invention relates to devices for recording railway track condition, that is to say, surface or alignment condition and has a particular application to alignment condition. A system is provided which comprises a light transmitter mounted on an independent front buggy and which projects an infrared reference beam along the track towards an infrared beam receiver which is mounted on a car for movement along the track. A shadow board is mounted on a frame which may be attached to the car carrying the receiver or which may be mounted on an independent car and positioned between the transmitter and the receiver. The transmitter, receiver and shadow board frame are all referenced to the track. The shadow board is slidably mounted on its frame for outward or inward movement on the frame to hunt about a line of sight drawn between the transmitter and receiver. The hunting motion of the shadow board is controlled from the receiver which acts to drive the shadow board out into the path of the beam when the transmitter is receiving the transmitted beam and to command the shadow board to retract out of the path of the beam when the transmitted light is obscured by the shadow board from the receiver. In this fashion the shadow board is caused to hunt about a deadband datum and to provide with the transmitter and receiver a reference line to which the track condition may be referenced. An electrical or mechanical sensor is provided on the frame to sense the movement of the shadow board relative to the frame and to provide a signal to drive a pen on a moving chart-recording system. The chart is driven from the wheels of the system so that the chart moves along at a speed proportional to the speed of the system movement along the track and the pen traces on the chart a record of the track errors as a function of the shadow board movement from its datum.

3,604,118

DRAFTING INSTRUMENT

David D. Miller, 259 S. Robertson Blvd., Beverly Hills, Calif.

Filed Jan. 13, 1970, Ser. No. 2,553
Int. Cl. B43l *13/14*
U.S. Cl. 33—104 2 Claims



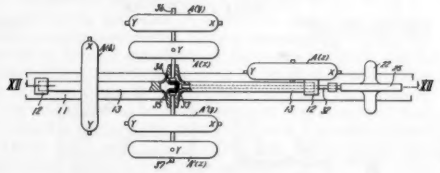
A drafting or drawing instrument is disclosed herein comprising a planar member having a base edge and parallel side edges extending perpendicular from the opposite ends of the base edge. An elongated central portion is integrally formed with the member midway between the side edges so as to cantilever outwardly therefrom. A pair of diverging upper edges extend between the opposite sides edges and the junction of the central portion with the member so as to define a pair of equal angles on either side of the central portion. Proportional scales are provided on all straight edges and a plurality of proportional ellipses are formed in the member. Provision is made for carrying a protractor to allow accurate positioning of the member at any 5° increment angle from 0° to 360° so that a single unitary drafting instrument is produced. Means are provided for detachably coupling the member to the arm of a conventional drafting machine and for assisting manual positioning of the member about the working surface of a drafting board.

3,604,119

AUTOMATIC SURVEYING APPARATUS

Hiroshi Inoue, 358-2, 1-Chome, Honda Machi, Chiba-ken, Japan

Filed Jan. 9, 1969, Ser. No. 790,075
Int. Cl. G01c *7/04, 9/06*
U.S. Cl. 33—142 5 Claims



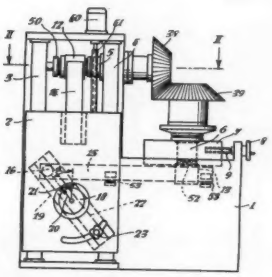
An automatic surveying apparatus has a controlled shaft mounted along the longitudinal axis of a vehicle for free rotation around its longitudinal axis. An automatic level controller maintains the position of said shaft constant with respect to the horizontal as the vehicle body inclines from side to side. An elevation-measuring level is mounted on the controlled shaft to produce an output with the change in elevation of the vehicle. Two lateral shafts, an adding shaft and a subtracting shaft, are rotatably mounted on said controlled shaft and extend laterally in opposite directions from said controlled shaft perpendicular to the longitudinal axis thereof and horizontally, and a departure-measuring level is mounted on each of said two shafts with the normally level position of each level parallel to the longitudinal axis of said controlled shaft, and a latitude-measuring level is mounted on each of said two shafts with the normally level position of each level perpendicular to the longitudinal axis of said controlled shaft. The adding and subtracting shafts are driven in opposite directions by means for indicating a reference azimuth proportional to the change in direction of said vehicle relative to the reference azimuth, the elevation-measuring level, departure-measuring levels and latitude-measuring levels are liquid levels having liquid pressure-sensitive electrical resistances therein responsive to changes in the liquid pressure in said levels in proportion to the amount the position of the levels changes, and each of said levels has an electrical circuit coupled thereto in which said resistances are incorporated for producing a current when the level is moved from its normal level. Power supply means provides a power output to the circuits in proportion to the speed of the vehicle. The circuits for the two departure-measuring levels are coupled to each other for producing a current flow in proportion to the departure of the vehicle from a point of origin, and the circuits for the two latitude-measuring levels are coupled to each other for producing a current flow in proportion to the latitude of the vehicle from a point of origin. Integrating means integrates the output of said circuits.

3,604,120

TOOTHED GEARWHEEL SINGLE FLANK TOTAL COMPOSITE ERROR-TESTING APPARATUS

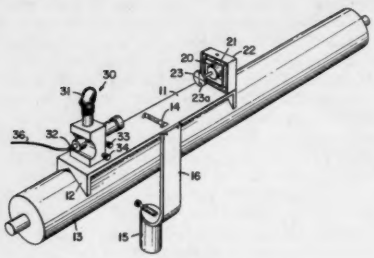
Karl Muller, Zurich, Switzerland, assignor to Maag Gear Wheel & Machine Company, Limited, Zurich, Switzerland

Filed Feb. 25, 1969, Ser. No. 801,973
Claims priority, application Germany, Mar. 15, 1968, P 16 73 86.7
Int. Cl. G01b *5/24*
U.S. Cl. 33—179.5 C 4 Claims



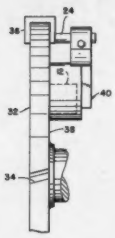
In apparatus for testing for single-flank total composite error in a bevel gearwheel transmission at a required center spacing and in which the gearwheels to be tested are coupled each to a respective cylindrical measuring disc, and two straight edges roll upon said measuring discs without sliding thereon, one of said straightedges acting upon indicating means, the measuring discs being constructed as base circle discs of constant diameter independently of the transmission ratio of the gearwheels to be tested, and the longitudinal motions of the two straightedges being matched to each other by way of a control bar which is angularly adjustable in accordance with the transmission ratio of the gearwheels, the control bar being mounted on a slide which carries the two straightedges, the other said straightedge having a body rectilinearly guided on said control bar, the axes of the two base circle discs are disposed perpendicularly to each other.

3,604,121
ROLL ALIGNMENT METHOD AND APPARATUS
Harold R. Hull, San Leandro, Calif., assignor to Hexcel Corporation, Dublin, Calif.
Filed June 7, 1968, Ser. No. 735,282
Int. Cl. G01b *5/24*; **G01c** *19/24*
U.S. Cl. 33—182 **10 Claims**



A roll alignment method and apparatus having a platform adapted for sequential placement on a plurality of rollers to be made codirectional in which a gyro-controlled optical reflective device is gyro-stabilized on the platform with reference to the first of the rollers so that the platform can be moved to subsequent rollers for alignment of the subsequent rollers with the gyro reference.

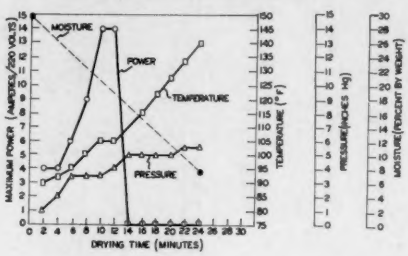
3,604,122
MAGNETIC SETUP GAUGE
Hubert Dupuis, Warren, Mich., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.
Filed Apr. 9, 1969, Ser. No. 814,583
Int. Cl. B27g *23/00*
U.S. Cl. 33—185 **1 Claim**



Gauge for setting cutting inserts into a holder comprising a support including magnets for attachment to the holder, and an adjustable gauging abutment on the support.

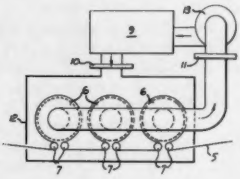
3,604,123
PROCESS FOR DRYING WET VEGETABLE PROTEIN PRODUCTS
William H. King, Metairie, La., assignor to The United States of America as represented by the Secretary of Agriculture
Filed Mar. 31, 1970, Ser. No. 24,312
Int. Cl. F26b *3/00*, *7/00*
U.S. Cl. 34—9 **2 Claims**

This invention relates to an improved process for removing water from wet vegetable protein products such as those resulting from absorption of reaction medium during wet processing of the natural vegetable proteinaceous material, which process involves raising the pH of the material within



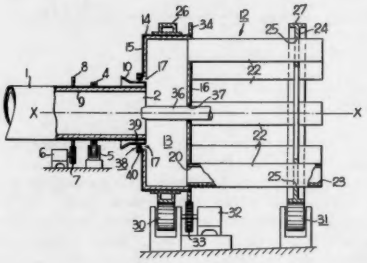
the range 7.0 to 9.0 or alternatively lowering the pH within the range 4.0–5.0.

3,604,124
CONDITIONING OF TEXTILE FABRICS
John Albert Medley, Leeds, and Thomas Gerald Cawthray, Ilkley, both of, England, assignors to Wool Industries Research Association, Leeds, England
Filed Dec. 20, 1968, Ser. No. 785,669
Claims priority, application Great Britain, Dec. 23, 1967, 58575/67
Int. Cl. F26b *3/00*
U.S. Cl. 34—23 **6 Claims**



Moisture content of a textile fabric is raised by passing moist air through the fabric. Total moisture content of the air is gaseous, i.e., air is not completely saturated. Fabric is supported during treatment by a movable air-permeable surface, e.g., a drum or conveyor belt, and a fan forces the moist air through the fabric after the air passes through a humidifier.

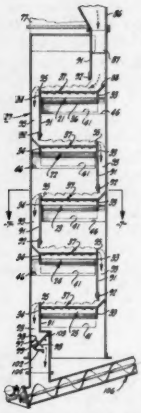
3,604,125
TUBULAR ROTARY COOLER
Edward H. Baxa, Genesee Depot, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Nov. 19, 1969, Ser. No. 877,889
Int. Cl. F27b *7/38*
U.S. Cl. 34—32 **4 Claims**



A rotary kiln and cooler installation is disclosed, including a generally horizontal rotary kiln, a drive engaging the kiln

for turning the kiln about its central axis, and a rotary cooler. The cooler assembly includes a material receiving and distributing drum having a cylindrical shell and first and second end walls. The first end wall is an annular wall defining a central material receiving opening. The second end wall defines a plurality of material discharge ports arcuately spaced from each other and arranged in close proximity to the cylindrical shell. A cluster of material cooling tubes, with one of the tubes being connected to each other of the ports in the second end wall of the drum, are arranged to be parallel to each other and the cylindrical shell of the drum. The tubes each have a discharge opening on an end thereof remote from said drum. Support means engage the assembly for carrying the drum and tubes for rotation about a central axis passing through the drum and cluster of tubes and the assembly is supported with the central axis sloped downwardly from the drum toward the tube discharge openings. Drive means engage the cooler assembly for turning the drum and cluster of tubes around the central axis at a rate independent of the rotation of the kiln and the material is distributed from the drum into the cooling tubes.

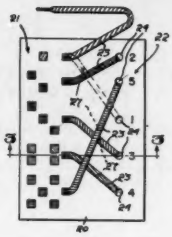
3,604,126
GRAIN TREATMENT APPARATUS
John C. Whelan, Woodland, Calif., assignor to Adams & Whelan
Filed Feb. 11, 1970, Ser. No. 10,506
Int. Cl. F26b *17/00*
U.S. Cl. 34—57 C **10 Claims**



Grain treatment apparatus has a plurality of air boxes arranged one above the other in a column, each box having a perforated upper, horizontal surface constituting a tray. An air circuit includes a manifold for receiving air from spaces between the boxes and leading to an air-grain separator and a source of heat. Grain is fed to the uppermost tray, travels thereover and descends in a zigzag, series path over the other trays to a valve releasing the treated grain at a predetermined rate. There are walls and curtains and weirs within the column to define the air and grain passages.

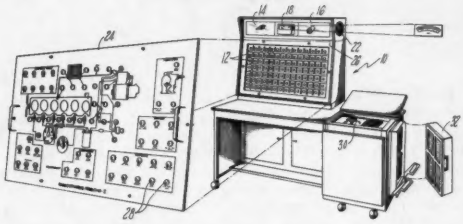
3,604,127
EDUCATIONAL DEVICES
Laurence F. Howatt, 14 Lafayette Terrace, Nahant, Mass., and Charles L. Tilley, 41 Elm St., Saugus, Mass.
Filed July 28, 1969, Ser. No. 848,143
Int. Cl. G09b *3/00*
U.S. Cl. 35—9 R **24 Claims**

Educational devices are disclosed that have stringlike members, each associated with an appropriate unit of a first series and adapted to be passed through any one of a series of holes, each associated with a unit of a second series, thereby to relate appropriate units of the two series together with code means concealed while the members are inserted



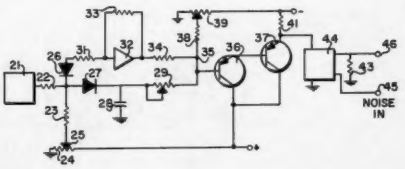
through the holes and useable while the members are thus attached.

3,604,128
SYSTEM MALFUNCTION ANALYSIS REINFORCEMENT TRAINER
Alfred J. Homann, Cinnaminson, N.J., assignor to EDP-ECC Corporation, Washington, D.C.
Filed Mar. 17, 1969, Ser. No. 807,869
Int. Cl. G09b *25/02*
U.S. Cl. 35—13 **20 Claims**



A teaching machine characterized by visual displays and provision for active student response, the invention including an audio system for simulating sound effects associated with the problem being solved by the student. The invention also comprises a programmable meter which enables simulation of measurements which would be taken by a student on actual equipment under various conditions and a clock circuit which enables dynamic programming of the apparatus.

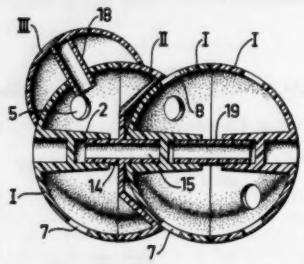
3,604,129
BREATH SOUND GENERATOR
Robert M. Eisenberg, Derwood, Md., assignor to Singer-General Precision Inc., Binghamton, N.Y.
Filed Dec. 4, 1969, Ser. No. 881,965
Int. Cl. G09b *23/28*
U.S. Cl. 35—17 **10 Claims**



Apparatus is described for generating electrical signals having the same general waveform as the waveform of the sound produced by human breathing. The apparatus comprises a sinusoidal generator, means for adding a DC bias to said sinusoidal wave, means for accepting the two polarities

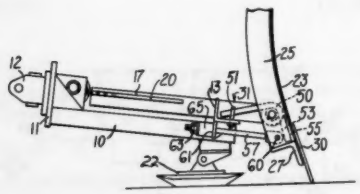
of the sinusoidal wave, means for operating on the two halves separately, and means for combining the two halves into a single waveform and using that waveform to modulate a white noise source.

3,604,130
CONSTRUCTION SERIES FOR MOLECULAR MODELS
Bo Forsstrom, Skalby, Sweden, assignor to Incentive AB, Stockholm, Sweden
Filed June 27, 1969, Ser. No. 837,095
Claims priority, application Sweden, July 5, 1968, Apr. 14, 1969, 9342-1968;5230-1969
Int. Cl. G09b *23/26*
U.S. Cl. 35—18 A **21 Claims**



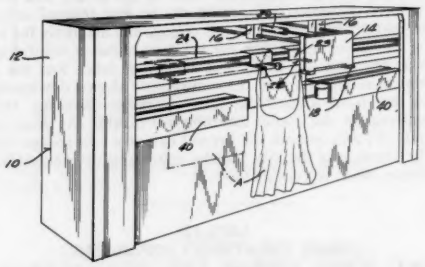
Plural units can be assembled to form models of molecules, and a first unit has the shape of a sphere segment which is larger than a semisphere and has a flat surface formed with a recess and is preferably shell-shaped. A second unit has the shape of a sphere segment which is smaller than a semisphere and has the same radius as the first unit, and the first and second units can be assembled to form a complete sphere. Two of the first units can be assembled so that the spherical surface of one is situated in the recess of the other, thus representing two atoms having their electron clouds intermingled. The units are formed with apertures in their spherical surfaces and with pegs cooperable with the apertures to assemble units to each other.

3,604,131
MOLDBOARD SUPPORTING STRUCTURE
Thomas M. Bogenschutz, Clayton, and Eugene A. Farrell, Evans Mills, both of, N.Y., assignors to Compro-Frink Corporation, Clayton, N.Y.
Filed Oct. 22, 1969, Ser. No. 868,325
Int. Cl. E01h *5/04*; **A01b** *61/04*
U.S. Cl. 37—42 VL **2 Claims**



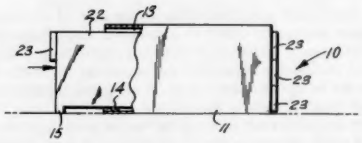
A torsion spring is arranged coaxial with the pivotal mounting of the snowplow moldboard. One end of the spring is fixed to the moldboard supporting frame. The opposite free end of the spring acts against the moldboard assembly below the pivotal mounting thereof to yieldingly restrain movement of the moldboard assembly about its pivot in the event the blade of the moldboard strikes a fixed object.

3,604,132
SPREADER DEVICE FOR FLATWORK
Richard D. Thompson, and Paul W. Frisby, both of Salt Lake City, Utah, assignors to McGraw-Edison Company, Elgin, Ill.
Filed May 18, 1970, Ser. No. 38,097
Int. Cl. D06f *67/04*
U.S. Cl. 38—143 **17 Claims**



Improved device for spreading large articles of flatwork and for feeding same onto a conveyor, and including a beam supported transverse to the conveyor adapted to be reciprocated over the conveyor; where two sleds are mounted on the beam and means reciprocate the sleds, clamps suited to grip the leading edge of the article carried by the sleds and adapted to slide between remote end positions within the sleds whereat detent means hold the clamps until sled separation draws the leading edge tight whereupon the clamps shift to adjacent end positions within the sleds, and a control responsive to the leading edge being drawn tight to stop the sled separation subsequently; where the sled-separating means includes a loop trained over rotatable elements at the beam ends, and a power shaft supported independently of the beam but extended parallel to the beam movement that slides axially within but is keyed to one of the elements; and where the means to reciprocate the beam includes a second loop trained over rotatable elements spaced apart in the direction of conveyor travel and having separate parallel runs, lateral guides for the loop runs and means connecting the loop to the beam.

3,604,133
ADVERTISING DISPLAY
Andrea T. Hawa, 441 Oakdale Ave., Chicago, Ill.
Filed Sept. 23, 1969, Ser. No. 860,360
Int. Cl. G09f *11/30*
U.S. Cl. 40—65 **2 Claims**

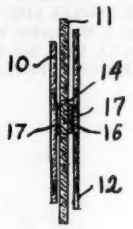


A device for advertising consisting of a hollow sleeve with an easel support enabling it to remain upright upon a surface. This device includes a plurality of enclosed display cards which may slip out from either end partially depending upon the user's selection.

3,604,134
PIVOTS FOR ROTARY SURFACES
Charles F. Clark, 99 Avondale Road, Yonkers, N.Y.
Filed Jan. 30, 1969, Ser. No. 795,305
Int. Cl. G09f *11/04*
U.S. Cl. 40—70 **2 Claims**

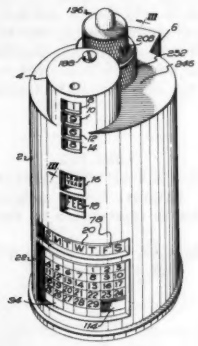
Two or three sheets of strong paper, cardboard or any other suitable material are joined so that they can rotate rela-

tively to each other by impressing upon an inner sheet a centrally located circular area and firmly connecting it to a similar area located upon another sheet. Then the circular area of the inner sheet can be separated to form a disc and



the inner sheet can be rotated around that disc. The central area or areas of the outer sheet or sheets can be embossed to form projecting areas firmly connected with the rotary disc of the central sheet.

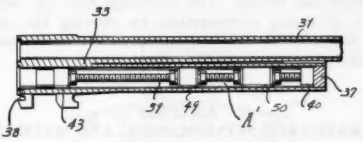
3,604,135
CALENDARS
John Joseph Robinson, 24 Ardee Road, Preston, County of Lancaster, England
Filed Sept. 30, 1969, Ser. No. 862,239
Int. Cl. G09d *3/08*
U.S. Cl. 40—113 **8 Claims**



A mechanical calendar for indicating the day of the week on which a date in any month in a year falls. Symbols for indicating the year numeral, the date numeral, the days of the week and months of the year being arranged on peripheries of annular gears which can be selectively interconnected by gearing mounted in a movable cradle. The cradle is moved so that the gearing selectively engages the year numeral annular gears and the date data annular gear such that when the gearing rotated by a person operating the calendar to change the year numeral to a desired year the date data displayed is simultaneously altered. The cradle is then further moved by the operator to bring the gearing into selective engagement with the months annular gear and the days of the week annular gear so that by further rotation of the gearing to bring the desired month into display the day of the week data displayed is also simultaneously altered.

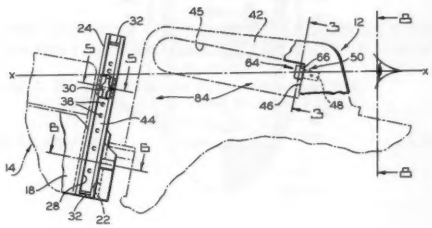
3,604,136
SHOTGUN COUNTERBALANCE
Jesse B. Edwards, 269 Herbert St., Madison, Ill.
Filed Sept. 5, 1968, Ser. No. 758,654
Int. Cl. F41c *27/00*
U.S. Cl. 42—1 R **1 Claim**

A counterbalance for use in shotguns of all types mountable within a compartment below the barrel and having a threaded shaft and at least one weight engaged upon said



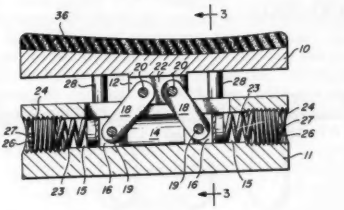
shaft for selected disposition axially thereof so as to compensate for any imbalance.

3,604,137
SIGHTING SYSTEM FOR A FIREARM-CARRIED GRENADE LAUNCHER
Stanley D. Silsby, Granby, Mass., assignor to The United States of America as represented by the Secretary of the Army
Filed June 17, 1969, Ser. No. 834,117
Int. Cl. F41c
U.S. Cl. 42—1 S **5 Claims**



A sighting system for a grenade launcher carried by a shoulder-supported firearm includes a front sight mounted on the launcher for elevational adjustment by means of a track disposed at a predetermined angle relative to the vertical axis thereof to compensate for grenade drift as the front sight is moved along the track for range adjustment. The rear sight is adjustable for windage correction and is pivotally mounted on the firearm so as to be swung thereagainst, out of the way, when not in use.

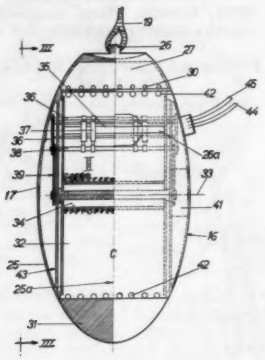
3,604,138
FIREARM RECOIL PAD SHOCK ABSORBER
Jack W. Wilson, 8211 E. Garfield, Phoenix, Ariz.
Filed Sept. 4, 1969, Ser. No. 855,171
Int. Cl. F41c *23/00*
U.S. Cl. 42—74 **7 Claims**



An improved shock absorber, particularly a shock absorber adapted for use as a recoil pad in handheld firearms. A pair of body members are secured in movable relationship to each other. A projection from the first body member extends into a mortise in the second body member. Pistons are disposed in bores in the second body member and contact

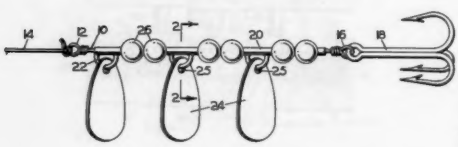
springs which are also disposed in said bores. The outer portions of the bores are threaded to receive adjusting screws. As the first body member moves toward the second body member, the pistons compress the springs thereby absorbing recoil from the firearm. The individual user can adjust the amount of spring compression by moving the adjusting screws inwardly to increase compression or outwardly to decrease compression of the springs.

3,604,139
APPARATUS FOR SEINE PURSING AND METHOD FOR PURSING A SEINE THEREBY
Paul Strom, 5302 Strusshanm, and Erling Allers, Salasen 43,, 5050 Nesttun, both of, Norway
Filed May 9, 1969, Ser. No. 823,373
Int. Cl. A01k *73/12*
U.S. Cl. 43—4.5 **13 Claims**



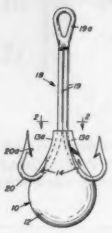
A submersible winch assembly for pursing a Seine includes a supporting housing, a spool device rotatably supported in the housing, a motor supported in the housing operatively connected to the spool, opening means in the housing for admitting one or both ends of the Seine-pursing line on to the spool device, and suspension means for supporting the winch assembly from a fishing vessel in a suspended submerged position in the vicinity of the bottom level of the Seine, and means for transmitting power from a source on the vessel to the motor, including means for remotely controlling and operating the winch in submerged position from the fishing vessel.

3,604,140
FISH LURE
Dudley W. Nelson, Portland, Oreg., assignor to Maxwell Manufacturing Co., Vancouver, Wash.
Filed Feb. 4, 1969, Ser. No. 796,334
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.13 **4 Claims**



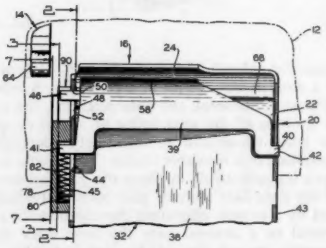
A fish lure having supporting shaft portion with an eye at one end for connection to a fishline and an eye at its other end for connection to a hook. Rotatably mounted on the shaft is a sleeve to which are connected multiple flasher blades. All the flasher blades are connected to the sleeve or to the shaft through openings in the sleeve so that as the lure is trolled through the water the said blades and sleeve rotate in unison. In one embodiment, the sleeve comprises a one-piece, full-length member and in another embodiment, the sleeve is segmented to facilitate assembly of the lure.

3,604,141
SNAG-PREVENTIVE SINKER FOR TREBLE FISHHOOKS
Robert E. Spencer, Rt. 2, Nokesville, Va.
Filed Apr. 11, 1969, Ser. No. 815,378
Int. Cl. A01k *95/00*
U.S. Cl. 43—44.81 **1 Claim**



A lead sinker for a three-pronged fishhook is formed in a mold. The sinker has a hemisphericallike bottom from which there extends upwardly three spaced-apart tongue portions, forming therebetween a void space and their spacing projects as slots into the top of the hemisphericallike bottom. The bottoms of the slots are concave to conform to the curved portion of the fishhook that extends outwardly from its central shank. The shanks and curved portions of the hooks are received in the void space between the tongues and in the slots. Each tongue has an integral formed flap along one respective edge and this flap is bent over the nested shank of the hook thereby forming a smooth closed securement over the shank.

3,604,142
FOUR-STACK CARTRIDGE MAGAZINE
Stanely D. Silsby, Granby, Mass., assignor to The United States of America as represented by the Secretary of the Army
Filed June 30, 1969, Ser. No. 837,452
Int. Cl. F41c *25/02*
U.S. Cl. 42—50 **7 Claims**

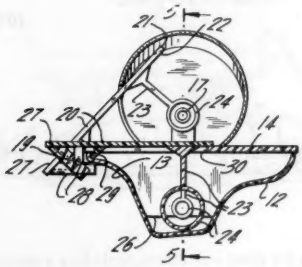


A firearm magazine for holding four stacks of cartridges and successively positioning them for removal includes partition-separated primary and secondary chambers each adapted for holding a double-stack in staggered relationship. The partition includes a divider pivotally mounted for vertical displacement to open the chambers for loading cartridges thereinto and rotational displacement to releasably retain the cartridges in the secondary chamber until the primary chamber is depleted. The divider is releasably blocked in the retaining position by a slide actuable by the follower in the primary chamber when depleted, to release the cartridges in the secondary chamber.

3,604,143
DOUBLE-EYE FISHHOOK
Charles T. Sauers, 412 E. Princeton, Ontario, Calif.
Filed July 2, 1969, Ser. No. 838,555
Int. Cl. A01k *91/04*
U.S. Cl. 43—44.83 2 Claims

A fishhook with a shank having a guide at one end and a bight with a barbed point at the other end, and an anchor eye formed on the shank between the guide eye and the bight. The fishhook is secured to the fishing line by passing the line through the guide eye wrapping it around the shank, passing the line through the anchor eye wrapping it around the shank again and passing it back through the guide eye.

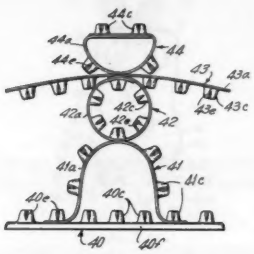
3,604,144
BUBBLE-BLOWING TOY
Samuel Span, 93 Belmont Ave., Teaneck, N.J.
Filed July 31, 1968, Ser. No. 749,212
Int. Cl. A63h *33/28*
U.S. Cl. 46—7 6 Claims



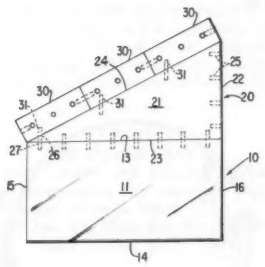
A toy for selectively blowing bubbles of various sizes having a funnellike blowing tube with a mouthpiece on the smallest end of the funnel, a fluid container below the funnel and a plurality of bubble-forming rings dipping into the container. The bubble-forming rings are finger operated by "keys" to tilt them out of the container and into the centerline of the bubble-blowing action of the funnel.

3,604,145
SEVERAL FLEXIBLE STRIP HAVING NESTABLE CUP ELEMENTS THEREON
Victor Zimmerman, 64-56 Ellwell Crescent, Rego Park, N.Y.
Filed Sept. 3, 1968, Ser. No. 756,813
Int. Cl. A63h *33/08*
U.S. Cl. 46—25 8 Claims

An elongate strip of stiff flexible sheet material having formed therein a row of openings and provided with a plurality of bounding walls upstanding from the strip and each extending about a respective opening. The strips may be frictionally connected by nesting the bounding walls of one strip in the opening of another.



3,604,146
RECTANGULAR AND TRIANGULAR BLOCKS WITH MEANS ENABLING ONE PIN TO CONNECT THREE BLOCKS
David A. Winer, 88 Balcort Drive, Princeton, N.J.
Filed Sept. 13, 1968, Ser. No. 759,732
Int. Cl. A63h *33/12*
U.S. Cl. 46—26 1 Claim

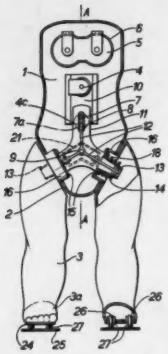


A set of rectangular and triangular building blocks of uniform thickness having holes around their peripheral side faces with the centers of the holes being spaced apart a distance equal to the thickness of the blocks and the centers of the end holes being a distance of about one-half the block thickness from the respective face ends. The holes include some enabling a single straight dowel to connect two rectangular blocks, each parallel to a respective side face of a triangular block lying therebetween.

3,604,147
WALKING DOLL
Enrico Ceccon, Noale, Venezia, Italy
Filed May 28, 1969, Ser. No. 828,630
Claims priority, application Italy, May 28, 1968, Feb. 25, 1969, 60-230-A/68;60-213-A/69
Int. Cl. A63h *11/14*
U.S. Cl. 46—150 10 Claims

Self-walking doll having an inner motor-driven mechanism

comprising a crank-operated equilateral lever arm system.



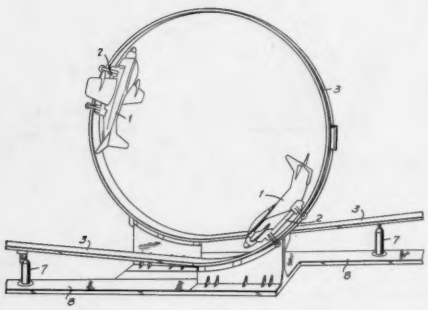
Two arms of the lever arm system are articulatedly jointed to a pair of limbs, such as legs.

3,604,148

TOY LAYOUTS FOR MODEL AIRCRAFT AND OTHER TOYS

Hermann Neuhierl, 8510 Furth (Bayern), Waldstr. 36, Germany

Filed Dec. 27, 1968, Ser. No. 787,533
Claims priority, application Germany, July 29, 1968, P 17 03 914.4
Int. Cl. A63h *19/00*
U.S. Cl. 46—216 **10 Claims**



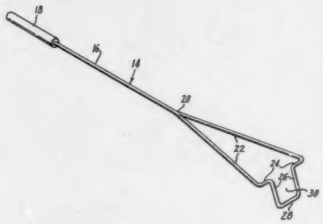
The layout is assembled from a plurality of track sections each comprising a rail length and adapted to be twisted so that the assembled sections define a desired track or path of spatial movement of the aircraft or other toy, the latter having drive mechanism including a support wheel which engages a running face at one side of the track, and including also a guide element adapted to engage a guide face at the opposite side of the track, said guide element cooperating with the associated support wheel to hold the toy on the track during movement therealong.

3,604,149

SPORTING PIECE FOR IMPELLING A HOOP OR WHEEL

Andrew P. Salontai, 2012 Woodstock Way, Sacremento, Calif.

Filed Apr. 28, 1969, Ser. No. 819,784
Int. Cl. A63h *33/02*
U.S. Cl. 46—220 **1 Claim**



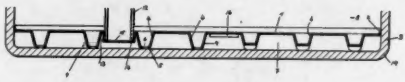
A preferably metal bar is provided at one end with a handle and at its other end with a closed-bottom recess adapted to engage the peripheral portion of a hoop or wheel to move it over a playing surface, the device being particularly intended as a game piece for use in a contest between two or more people rolling hoops or wheels in competition with each other.

3,604,150

INSET TRAY FOR PLANT CONTAINERS

Gerhard Baumann, Bumpliz-Bern, Switzerland, assignor to Interhydro A.G., Berne, Switzerland

Filed Aug. 11, 1969, Ser. No. 848,946
Claims priority, application Switzerland, Aug. 27, 1968, 12834/68
Int. Cl. A01g *9/02*
U.S. Cl. 47—34 **10 Claims**



An insert tray for plant containers, including a liquid-filling tube, and a plate-shaped tray for subdividing the plant container into a lower liquid space and an upper plant-cultivating space, said plate-shaped tray having hollow ribs extending downwardly from the surface of the tray and having openings at their bottom, the improvement of providing a removable liquid-filling tube and a unique shape of the ribs permitting attaching of a plurality of trays in a lesser height than previously required.

3,604,151

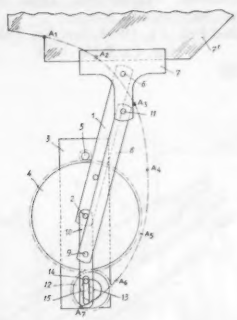
AUTOMOTIVE WINDOW REGULATORS

Pierre Ventre, and Andre Reilhac, both of Billancourt, France, assignors to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, France

Filed Oct. 21, 1969, Ser. No. 867,991
Claims priority, application France, Oct. 31, 1968, Aug. 13, 1969, PV 172274;PV 69/27,873
Int. Cl. E05f *11/52*
U.S. Cl. 49—227 **12 Claims**

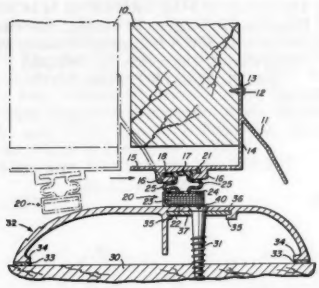
A window regulator notably for automobiles, of the twin-

link-type, characterized in that the links pivoted at one end to the glass-supporting bracket are so actuated that they do



not move in parallel relationship in order to cause the glass to follow a curved path.

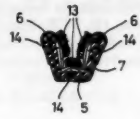
3,604,152
MAGNETIC THRESHOLD CONSTRUCTION
John M. Protzman, Dayton, Ohio, assignor to The Ever-Roll Manufacturing Corporation, Dayton, Ohio
Filed Oct. 20, 1969, Ser. No. 867,485
Int. Cl. E06b *1/70*
U.S. Cl. 49—470 **6 Claims**



A threshold assembly which includes a stationary lower threshold plate and a resiliently mounted upper sealing member, one of which incorporates a magnet so that the sealing member is brought into sealing engagement with the lower threshold plate by magnetic attraction when the door with which the assembly is associated is closed. A ferrous backing strip may be installed with the magnet to concentrate the magnetic flux field and increase the strength of the magnet and, if the member opposite the magnet is constructed of a nonferrous material, a second strip of ferrous material is mounted in that member.

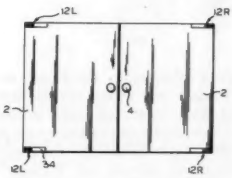
3,604,153
PROCESS FOR THE PRODUCTION OF A TEXTILE MATERIAL
Karl Hess, Althengstett Kreis. Calw, Germany, assignor to Strahle & Hess, Althengstett, Germany
Filed Oct. 23, 1968, Ser. No. 769,889
Int. Cl. E06b *7/16*
U.S. Cl. 49—441 **5 Claims**

A sealing strip for sliding glass window panes is formed by floating yarns of unshrinkable material on a base material



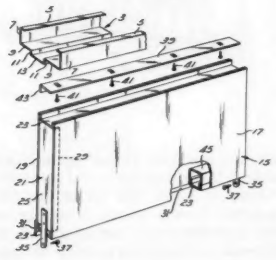
capable of shrinkage, so that when subjected to treatment to produce shrinkage a terry cloth material is produced.

3,604,154
CABINET DOOR CONSTRUCTION
Frank J. Curran, DownersGrove, Ill., assignor to Geneva Industries, Inc.
Filed Feb. 16, 1970, Ser. No. 11,391
Int. Cl. E06b *3/00*
U.S. Cl. 49—501 **10 Claims**



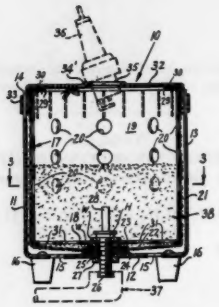
A cabinet construction and means are disclosed which makes it possible for even the most unskilled to properly hang wooden doors on steel kitchen cabinets, for instance, wherein the doors are notched at opposing edges adjacent the edge of the door which is to be hingedly secured by means of a specific hinge and adapter plate assembly wherein easy mounting of doors in a proper fashion is achieved.

3,604,155
TRANSOM PANEL
Arthur S. Brown, Girard, and Edward L. Durch, Warren, both of, Ohio, assignors to The American Welding & Manufacturing Company, Warren, Ohio
Filed Jan. 29, 1969, Ser. No. 795,014
Int. Cl. E06b *1/18, 7/00*
U.S. Cl. 49—504 **3 Claims**



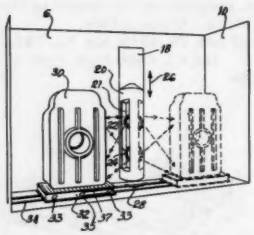
A hollow sheet metal transom which can be readily made with a minimum of hand labor and can be assembled with, and disassembled from, sheet metal doorjambs by a comparatively unskilled workman using only simple tools.

3,604,156
SMALL PORTABLE UNIVERSAL SPARK PLUG CLEANER
Thomas M. Diggs, 1349 Otis St. N.E., Washington, D.C.
Filed Jan. 10, 1970, Ser. No. 7,073
Int. Cl. B24c *3/06*
U.S. Cl. 51—8 5 Claims



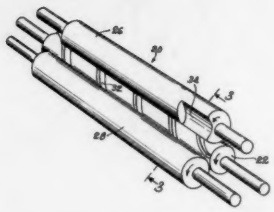
A spark plug cleaner is disclosed in which a sealed chamber is provided into which the sparking end of a spark plug is inserted. Sand in the chamber is agitated by air so as to blast against the electrodes of the spark plug and the lower end of the spark plug to clean carbon deposits therefrom. A filter is provided to permit the escape of air from the chamber without permitting the escape of sand therefrom.

3,604,157
BLAST MACHINE WITH AUTOMATIC BLAST WHEEL POSITIONER
James W. Fogle, Walkerton, Ind., assignor to The wheelabrator Corporation, Mishawaka, Ind.
Filed Apr. 10, 1969, Ser. No. 815,069
Int. Cl. B24c *3/14*
U.S. Cl. 51—9 12 Claims



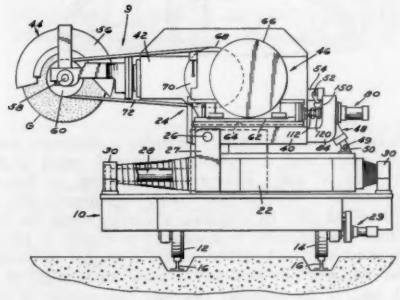
This application discloses a blast machine which includes a turret movable in a vertical plane and rotatable in a horizontal plane. Mounted inside the turret are throwing wheels which are supplied from a source of surface-treating material. The turret is mounted in a wall of a blast chamber so that when a workpiece to be treated is inside the chamber the turret may be moved vertically and rotated horizontally to insure treatment of the entire surface of the workpiece. The workpiece may be mounted on a carriage and moved to different positions within the chamber. The application also discloses an automatic control system so that the motions of the turret and the carriage may be controlled by a program stored on a data storage medium.

3,604,158
APPARATUS FOR TREATING CYLINDRICAL WORKPIECES
Robert L. Daffron, Mishawaka, Ind., assignor to The Wheelabrator, Mishawaka, Ind.
Filed Feb. 11, 1969, Ser. No. 798,370
Int. Cl. B24c *3/14*
U.S. Cl. 51—15 8 Claims



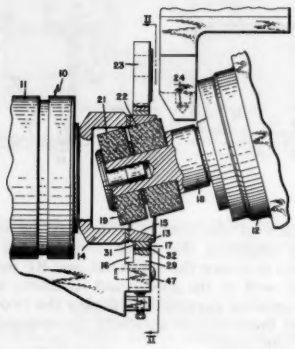
In order to provide for the complete surface treatment of cylindrical workpieces a surface-treating machine is provided with a roll cluster including a feed roll and guide rolls extending through a treatment chamber. The feed roll has a screw flight having a pitch a little greater than the length of a workpiece and workpieces are deposited in one pitch length of the screw flight by a contoured portion in one of the guide rolls.

3,604,159
BELT TIGHTENER FOR GRINDING MACHINES
Richard G. Hopkins, Bennington Township, Shiawassee County, Mich., assignor to MWA Company, Owasso, Mich.
Filed Dec. 2, 1969, Ser. No. 881,364
Int. Cl. B24b *7/02*; F16h *7/10*
U.S. Cl. 51—35 11 Claims



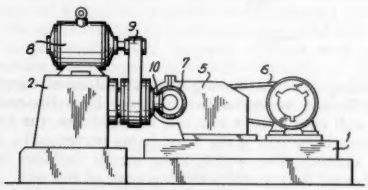
The disclosure relates to a belt tightener for a grinding machine. A drive unit has a belt extending to the grinding wheel, and a power device has a lost-motion connection with the drive unit to retract the drive unit away from the grinding wheel to tension the belt. A latch holds the drive unit retracted. A cam carried by the power device is operative within the limits of the lost-motion connection to release the latch when the power device is reversed to thereby untension the belt.

3,604,160
GRINDING MACHINE
Donald E. Ware, Jr., Westboro, Mass., assignor to The Heald Machine Company, Worcester, Mass.
Filed Apr. 23, 1969, Ser. No. 818,704
Int. Cl. B24b 5/00, 5/18, 41/06
U.S. Cl. 51—103 R 7 Claims



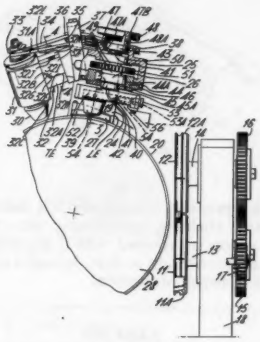
A grinding machine having fixed contact elements on which the workpiece is supported, the elements including a hardened metal insert floating on an elastomer bed.

3,604,161
ARRANGEMENT FOR LOCATION AND ROTATION OF WORKPIECES
Viktor Fedorovich Khrolenko, Zvezdnaya ul., 18, kv. 110; Askold Ivanovich Nefedov, Kolomyali, 2 Nikitinskaya ul. 8, kv. 5; Iosif Davydovich Gebel, Svetlanovsky prospekt, 35, kv. 54; Arkady Alexandrovich Zykov, prospekt Smirnova, 15, kv. 5.; Jury Viktorovich Kargin, ulitsa Smirnova 10a, kv. 21; Sergei Sergeevich Konovalov, ulitsa Smolyachkova 13 kv. 16, and Viktor Ivanovich Parshikov, prospekt K. Marx 70, kv. 93, all of Leningrad, U.S.S.R.
Filed Sept. 16, 1969, Ser. No. 858,387
Int. Cl. B24b 5/02
U.S. Cl. 51—237 10 Claims



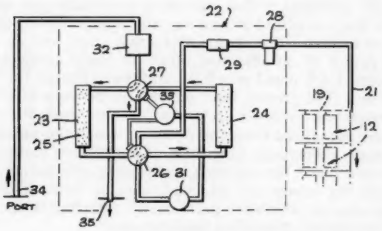
An arrangement to locate and rotate workpieces with a plane location face and a locating surface of rotation, used mainly for the machining of such workpieces and comprising a drive with a workpiece dog, supporting means, and force elements pressing the workpiece against the supporting means and the dog, wherein the supporting means constitute a combination of two stationary radial supports spaced apart to carry the workpiece surface of rotation, and at least one stationary axial abutment determining the position of the workpiece face. The workpiece dog is capable of self-alignment against the workpiece face, and the force elements are arranged so as to press the workpiece face against the axial abutment with a force less than that of the dog pressure against the workpiece.

3,604,162
GRINDERS FOR HELICAL CUTOFF KNIVES
Edward George Preston, and Philip Arthur Maw, both of London, England, assignors to Molins Machine Company Limited, London, England
Filed Dec. 16, 1968, Ser. No. 783,983
Claims priority, application Great Britain, Dec. 15, 1967, 57037/67
Int. Cl. B24b 9/00
U.S. Cl. 51—247 5 Claims



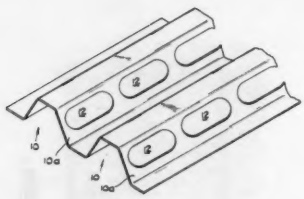
A cutoff, suitable for a continuous rod cigarette-making machine, and having a helical knife. To grind one side of the knife, a stationary grinding wheel inclined at the appropriate angle to grind a bevel edge on the knife is used. To grind the other side of the knife, a grinder wheel is carried by a planetary mechanism to travel in a circular path and so that, as the knife is being ground, the grinder has a motion transverse to the path of the knife.

3,604,163
PRESSURE-COMPENSATING SYSTEM FOR HERMETICALLY SEALED WINDOW UNITS
Richard H. McCurdy, Reseda, and Lawrence W. Connelly, Sherman Oaks, both of, Calif., assignors to Sitelines, Inc., Van Nuys, Calif.
Filed July 23, 1969, Ser. No. 844,024
Int. Cl. E06b 7/12
U.S. Cl. 52—172 6 Claims



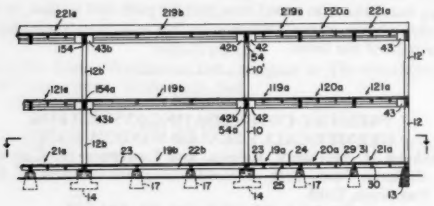
In an installation comprising a plurality of hermetically sealed multiple glazed window units, all of the window units are ducted to a common manifold. The manifold is ported to the atmosphere through pressure-compensating apparatus which vents air pressure built up within the system into the atmosphere, and admits filtered, dehumidified air drawn from the atmosphere into the system when ambient atmospheric air pressure exceeds the internal air pressure within the system.

3,604,164
PANEL
Anthony Frederick Festing Mason, Durban, South Africa, assignor to Festing Developments (Pty) Limited, Durban, Natal Province, South Africa
Filed Jan. 31, 1969, Ser. No. 795,552
Claims priority, application South Africa, Feb. 5, 1968, 68/0735
Int. Cl. E06b *1/12*
U.S. Cl. 52—206 **7 Claims**



The invention provides a panel which is suitable to be used for roofing, side cladding, partitioning, etc., which may be profiled and which is provided with a plurality of apertures dimensioned to permit light to pass through and covered with translucent or transparent material.

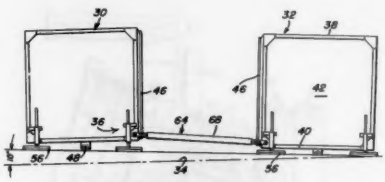
3,604,165
PANELLED DECK CONSTRUCTION FOR BUILDING
Jacob D. Naillon, 17 Diamond Drive, Danville, Calif.
Filed Apr. 25, 1969, Ser. No. 819,187
Int. Cl. E04b *5/43;* **F16m** *11/02*
U.S. Cl. 52—263 **16 Claims**



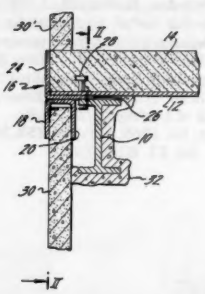
In a building having posts, a deck (either the ground floor, an elevated floor or the roof) is constructed from rectangular prefabricated panels which are arranged in parallel in each quadrant about a post, the panel orientations being progressively 90° different within successive quadrants, an outside panel of each quadrant having an outer edge radiating from a post and formed with a beam along that edge, and the ends of the panels of an adjoining quadrant being connected to that beam. Each panel may have additional frames for interconnection. The ground floor panels can be supported from the ground, as by a concrete slab or abutment; the other decks are supported from the posts, to which the means are supportedly connected. One form of connection includes an attachment block fast on each post having attachment faces to which the beams are attached, e.g., by bolts, if desired through spacers which are permanently attached to the ends of the beams and strengthen the beam ends.

3,604,166
DEPLOYMENT SYSTEM FOR SHELTER UNITS
William E. Ciccarelli, York, Pa., and Phillip A. Kaufman, Randallstown, Md., assignors to Gichner Mobile Systems, Inc.
Filed July 23, 1969, Ser. No. 843,939
Int. Cl. E04b *1/348;* **G21f** *7/00*
U.S. Cl. 52—126 **8 Claims**

A system and structural assembly for enabling two shelter units to be deployed in accurate relative relationship to enable the two shelter units to be expanded into an enclosure including levelling jacks with sliding pads at each corner of each shelter unit, an alignment bar for moving the shelter units in relation to each other and accurately aligning the shelter units so that the facing sidewalls of two spaced shelter units may be employed as the roof and floor of the space between the two shelter units and an auxiliary end wall carried by each of the shelter units may be employed for completely enclosing the space between the two spaced shelter units to insure the structural and RF integrity of the complex as well as the safety and reliability necessary for enabling operating personnel to deploy the two shelter units and expand them into an enclosure encompassing the space of three shelter units.



3,604,167
BUILDING CONSTRUCTION
Thomas M. Hays, One Rockledge, P.O. Box 6, Pleasantville, N.Y.
Filed Jan. 28, 1969, Ser. No. 794,571
Int. Cl. E04b *1/16;* **E04c** *3/20*
U.S. Cl. 52—282 **5 Claims**

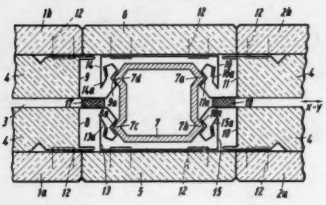


A building structure having a structural beam carrying a concrete floor is rendered fire resistant by a fire-resistant building wall held against one side of the beam, the bottom and the remaining side of the beam being protected by a fire-resistant coating. The wall-holding means includes an inverted channel that receives the top edge of the wall, plus a lateral extension secured to the structural beam. The holding means has an upstanding flange that serves as a screeding edge for leveling the concrete floor while fluid.

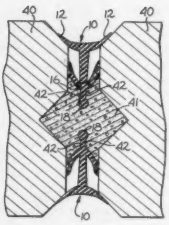
3,604,168
TWO-SECTIONAL PARTITION
Herwald Meineke, Grosshansdorf, Stormarn, Germany, assignor to C. Friese Innenausstattung GmbH, Hamburg, Germany
Filed Oct. 24, 1969, Ser. No. 869,277
Claims priority, application Germany, Oct. 24, 1968, P 18 04 935.9
Int. Cl. E04b *1/82, 2/78*
U.S. Cl. 52—393 **13 Claims**

A displaceable partition, especially for business and office buildings and factories, which comprises oppositely located

spaced boards with supporting post means therebetween which post means have longitudinally extending profiled portions resiliently and detachably engaged by resilient snap-on means connected to the inside of said board means.



3,604,169
SEALING STRIPS
Robert E. Smith, Lynwood, Calif., assignor to J-D Distributing Company, Bell, Calif.
Filed June 2, 1969, Ser. No. 849,225
Int. Cl. E04b *1/36*
U.S. Cl. 52—396 **5 Claims**

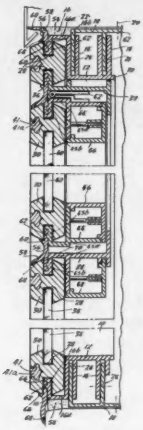


A unitary sealing strip for sealing the openings between the surfaces of laterally spaced wall members. The sealing device is made of a resilient material and is adapted to be forced into the space created by raised, prefabricated wall members, the device sealing the opening. Flanges with associated anchoring ribs prevent inadvertent dislodgement of the sealing strip. A securing member enables the sealing strip to be permanently secured in position when the wall members are joined into an integrated unit.

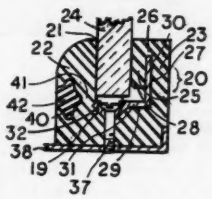
3,604,170
A SEALING ARRANGEMENT FOR A BUILDING STRUCTURAL ASSEMBLY
Richard Lewis Stoakes, Clouds Northdown Road, Woldingham, Surrey, England
Filed Jan. 15, 1969, Ser. No. 791,426
Int. Cl. E06b *3/62;* **E04f** *1/36*
U.S. Cl. 52—400 **7 Claims**

The sealing arrangements for structural assemblies which comprise one or more frames carrying window lights or opaque infill panels and which require weatherproof sealing with contiguous parts of the structural assembly.

The illustrated arrangements make use of known flexible sealing strips which hold the panes or panels in the frame by securing to such strips a supplementary sealing strip that is also flexible and extends from the frame to seal against an adjacent element of the structural assembly. This supplementary strip can bear freely against said element or it may be positively engaged thereby. The arrangement is equally applicable to sealing the adjoining edges of two adjacent frames or the adjoining edges of a smaller frame, e.g. an opening window light, in a larger frame.



3,604,171
REINFORCED FRAME MEMBER OF ELASTOMERIC MATERIAL
Louis Perilstein, 2416 24th Ave. East, Seattle, Wash.
Filed Sept. 10, 1969, Ser. No. 856,644
Int. Cl. E04b *1/66;* **E06b** *3/62*
U.S. Cl. 52—400 **4 Claims**

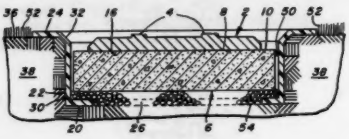


An elastomeric strip has a trough-shaped groove extending longitudinally along one side thereof to receive an edge of a panel, such as a sheet of glass and said elastomeric strip has in it a separable reinforcing and stiffening strip of approximately angle shaped cross section. One flange of the reinforcing strip extends across the bottom of the trough-shaped groove and is provided with a V-shaped groove containing cushioning material correctly positioned to receive and serve as a cushion for a panel edge supported within the trough-shaped groove of the elastomeric strip.

3,604,172
GRAVE MARKER PROTECTIVE STRUCTURE
Joseph J. Matvey, 208 Orin St., Pittsburgh, Pa.
Filed Aug. 5, 1969, Ser. No. 847,610
Int. Cl. E04h *13/00*
U.S. Cl. 52—103 **4 Claims**

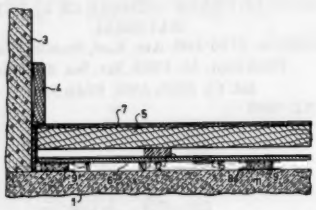
A unitary vegetation-retarding grave-marker-protective structure having a horizontal base portion defining an opening, a vertical transition portion terminating in a horizontally outwardly directed stabilizing ground-engaging flange which resists sinking of the marker assembly into the earth. The

transition portion having a lower substantially vertical portion and an upper portion which is upwardly and outwardly directed.



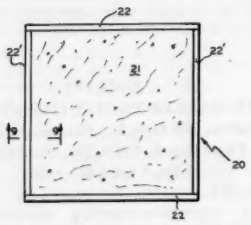
A rectangular rigid marker-supporting base in underlying face-to-face securement with an overlying grave marker. Drainage means between the marker-supporting base and receptacle for conducting water downwardly between the receptacle and marker base and out through an opening in the protective structure. Inwardly directed integral spacer means on the transition wall. Upwardly directed integral spacing means on the base portion.

3,604,173
RESILIENT FLOOR
Rune Ingmar Douglas Dahlborg, Ripsavagen 57, Bandhagen, Sweden
Filed Dec. 2, 1968, Ser. No. 780,515
Claims priority, application Sweden, Dec. 7, 1967, 16836/1967
Int. Cl. E04f *15/22*
U.S. Cl. 52—508 **6 Claims**



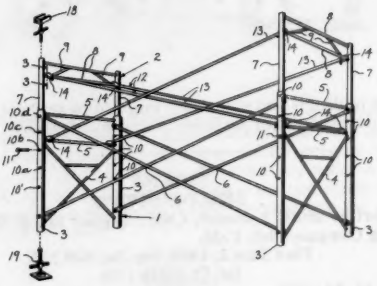
The invention relates to resilient or elastic floors comprising an upper floor supported on a resilient means lying on a support. Said resilient means is built up from a lower layer of resilient elements positioned on the support, an intermediate floor positioned on said lower layer, and an upper layer of resilient elements positioned on the intermediate floor and supporting said upper floor.

3,604,174
LIGHTWEIGHT STRUCTUAL PANEL
Thomas J. Nelson, Jr., 3472 Griffin Road, Syracuse, N.Y.
Filed Nov. 25, 1968, Ser. No. 778,621
Int. Cl. F04c *2/04, 2/34*
U.S. Cl. 52—601 **3 Claims**



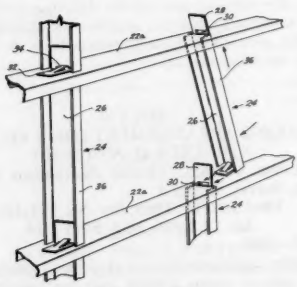
A structural building unit in the form of a panel that is lightweight yet strong and fireproof. The panel is comprised of light aggregate concrete bounded by a structural steel frame that serves initially as a form and subsequently as a connecting device. The unit, which is interiorly reinforced, can be utilized for exterior and interior walls, and for floors, ceilings and roofs.

3,604,175
ADJUSTABLE SHORING SYSTEM OR THE LIKE
Robert F. Gray, Brookfield, Wis., assignor to A-T-O, Inc., Milwaukee, Wis.
Filed May 22, 1970, Ser. No. 39,628
Int. Cl. E04h *12/08;* **E04g** *1/06*
U.S. Cl. 52—637 **4 Claims**



An adjustable shoring system includes base frames, extension frames which are vertically adjustable with respect to the base frames in a series of incremental steps, and gooser braces extending between headers on the extension frames and on the opposite base frames. The extension and base frames are each provided with two vertically spaced headers; and the headers on the extension frames are spaced apart a distance equal to one step of adjustment while the headers on the base frames are spaced apart a distance equal to two steps, as the result of which gooser braces of the same length can be used for each of a series of four steps of adjustment.

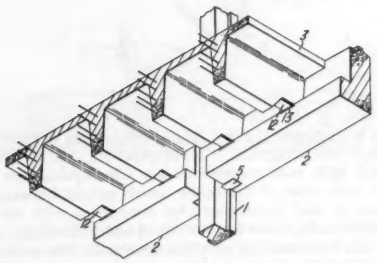
3,604,176
SELF-FASTENING SPACER FOR STRUCTURAL MEMBERS
Charles M. Campbell, Caringbah, New South Wales, Australia, assignor to Armco Steel Corporation, Middletown, Ohio
Filed Oct. 24, 1969, Ser. No. 869,138
Int. Cl. E04c *2/42, 3/09*
U.S. Cl. 52—660 **10 Claims**



A self-fastening spacer for intermediate support of structural members, such as purlins and girts, to aid in preventing sagging, twisting and rotation thereof. The spacer is provided with at least a web section having at one end a reduced tongue portion which is provided with an eye, and at the other end with a locking tongue which is substantially normal to the web and is provided with retaining means integral

therewith. Accordingly, when the reduced tongue portion of the spacer is fit through a perforation in a structural member, the locking tongue on an adjacent spacer may be driven through the eye such that the retaining means locks therein.

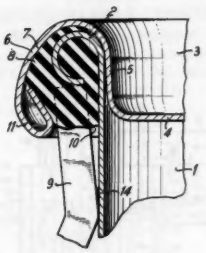
3,604,177
REENFORCED CONCRETE BUILDING FRAME CONSTRUCTION
Hugh Mary Clyne, 25, Sion Road, Glenageary, and Peter Joseph Faherty, Park Avenue, Dalepfort Road, Salthill, Galway, both of, Ireland
Filed Mar. 19, 1969, Ser. No. 808,532
Claims priority, application Ireland, Mar. 22, 1968, 335/68
Int. Cl. E04b *5/04, 5/23*
U.S. Cl. 52—283 **5 Claims**



In the reinforced concrete frame for a building consisting essentially of columns assembled with horizontal beams and with floor units extending between adjacent parallel beams, the beams and floor units are precast for assembly on the building site. According to the invention, in order to provide a simple but strong connection between the beams and columns a bracket consisting of a hollow steel joist section embedded in a column and projecting laterally is received within a channel-shaped steel shoe embedded in the end of the beam in interfitting relation on assembly of the beams and columns. To ensure accurate alignment and eliminate possible canting of the beam a second length of channel-shaped steel section is embedded in the column above said bracket and receives a tubular steel section secured to and projecting from the end of the beam upon assembly of the shoe and bracket. A stuff bar pushed through the tubular section may serve to connect two beams similarly supported on opposite sides of a column. The shoe and tubular section are welded to reinforcing bars, while floor units of double T-shaped cross section, the ends of which rest on flanges of the beams, are also secured by welding reinforcing elements thereof to reinforcing bars extending laterally from the beams.

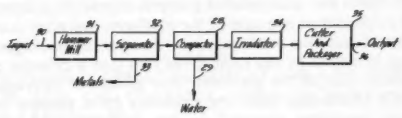
3,604,178
LOCK FOR PRESERVE CANS AND OTHER CONTAINERS AND A METHOD OF MAKING IT
Hans-Joachim Bluhm, Weddel, Germany, assignor to Schmalbach-Lubeca-Werke AG, Brauschweig, Germany
Filed Jan. 30, 1969, Ser. No. 801,226
Claims priority, application Germany, Feb. 15, 1968, P 16 57 161.2
Int. Cl. B65b *7/28*
U.S. Cl. 53—17 **1 Claim**

A lock for package containers, for example, preserve cans and tins, has a closed elastic cordlike ring located between the edge of the container and the edge of the cover and serving simultaneously for sealing and opening. To open the container, the ring is pulled by a strap carried by the ring out of the passage between the cover and the body of the container. The lock is particularly characterized in that this ring is brought into the sealing space formed between the edges of



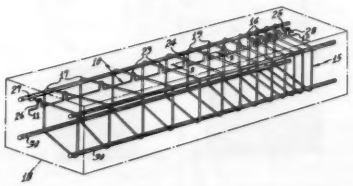
the container and cover in a liquid or plastic state and is hardened on location.

3,604,179
REFUSE DISPOSAL SYSTEM
Norman S. Lund, P. O. Box 246, Melbourne, Fla.
Filed Nov. 25, 1968, Ser. No. 778,686
Int. Cl. B65b *55/16, 63/02, 25/00*
U.S. Cl. 53—23 **5 Claims**



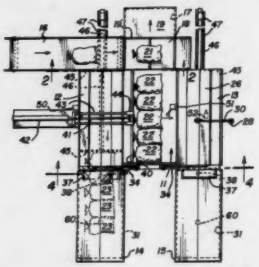
A refuse disposal method for disposing of garbage, trash, and similar refuse in which the refuse is ground to reduce its volume, irradiated and compacted, and may include steps for utilizing part or all of the components of the refuse.

3,604,180
SPACER ELEMENT FOR A REINFORCING MEMBER
John Wood, Jacksonville, Fla., assignor to Florida Wire and Cable Company, Jacksonville, Fla.
Filed Feb. 9, 1968, Ser. No. 704,468
Int. Cl. E04h *12/10*
U.S. Cl. 52—653 **6 Claims**



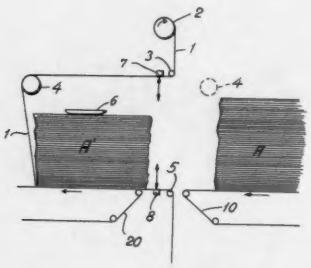
An elongated preformed and resilient spacer element having spaced loops wherein each loop includes a socket formed by the inner surface of the closed end of the loop and inwardly directed shoulders of the loop legs. The spacer element is forcibly connected to a coiled reinforcing member having a plurality of turns by passing a portion of each turn between the shoulders of respective loops causing temporary outward deformation thereof and into the sockets thereof resulting in each turn being locked within the loop and spaced from the next.

3,604,181
MASTER-CONTAINER-FILLING MACHINE
L. D. Adcox, 620 S. Adams St., Monte Vista, Colo.
Filed May 23, 1969, Ser. No. 827,267
Int. Cl. B65b 5/06, 35/40, 39/10
U.S. Cl. 53—61 18 Claims



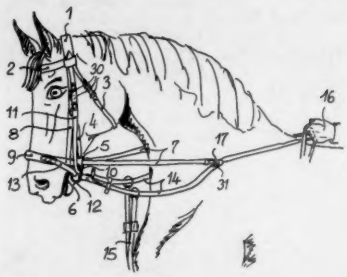
A machine for filling a master container with a plurality of packages by automatically moving the packages individually from a conveyor to a receiver-pusher device adjacent the conveyor, said device successively receiving, dropping and pushing a package onto an accumulator platform on which a predetermined number of packages are accumulated and from which the accumulated group is moved by a cross ram into a cylinder at one side of the platform, and after accumulation of another predetermined number of packages that group is moved by the same cross ram into a cylinder at the opposite side of the platform. The groups of packages are moved alternately from the cylinders by a plunger into a master container clamped on the discharge end of each cylinder.

3,604,182
APPARATUS FOR THE WRAPPING OF A BUNDLE OF NEWSPAPERS
Jens Thomsen Jepsen, Gyvelvey 5, Hjerting, Denmark
Filed Apr. 2, 1969, Ser. No. 812,810
Claims priority, application Denmark, Apr. 4, 1968, 1479/68
Int. Cl. B65b 13/20, 11/10; B31b 1/72
U.S. Cl. 53—124 C 1 Claim



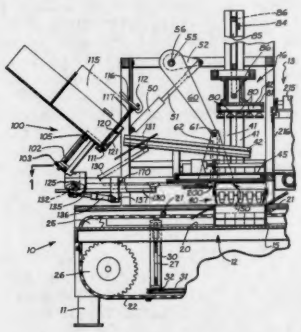
The bundle of papers are pressed together under the action of a reciprocally mounted press tongue. The press tongue is pressed onto the bundle as the bundle is enveloped by the plastic sheeting and remains there until the sheeting has cooled. Thereafter, the press tongue is removed to allow the bundle to expand against the plastic sheeting.

3,604,183
BRIDLE
Karl Iseli, Jun, Bei der Reithalle, 8914 Aeugst am Albis/Zurich, Switzerland
Filed Feb. 25, 1970, Ser. No. 14,028
Claims priority, application Switzerland, Feb. 28, 1969, 3295/69
Int. Cl. B68b 01/06
U.S. Cl. 54—6 15 Claims



There is disclosed a horse bridle comprising a headband, throatlatch and headpiece, a mouthpiece bit, and a first rein connected with said mouthpiece bit. Cheekpieces are provided at both sides of the bridle which extend between the headpiece to said mouthpiece bit connected with the first rein. Additionally, there is a noseband and a chinband, and a second rein is connected with this noseband. The bridle also has a martingale, and one of the reins are guided via the martingale and then connected with the other rein, so that when the horse goes in front of the rein, in other words is not being rein-checked the control of the horse at least for the most part occurs via the martingale-guided rein, whereas when the horse is rein-checked the control of the horse at least for the most part occurs via the rein which is not guided via the martingale.

3,604,184
LAYER PAD APPARATUS
James J. Shuttleworth, 10 Commercial Rd., Huntington, Ind.
Filed Apr. 28, 1969, Ser. No. 819,648
Int. Cl. B65b 35/38
U.S. Cl. 53—157 7 Claims



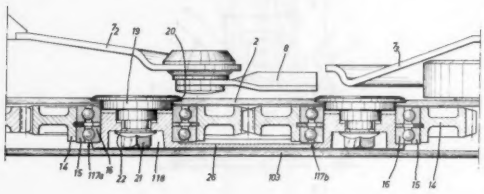
Apparatus for inserting layer pads between the layers of cans in a case being packed by a case-packing machine including a swingable arm with vacuum cups on the distal end thereof. The arm swings back and forth to pick up layer pads from a rack and deposits them in a horizontal position. The case packer includes a can carrying head which lifts the cans off of a platform and deposits them in the case when the platform is moved horizontally from beneath the head. A car-

riage is secured to the platform and is constructed to pick up layer pads deposited by the vacuum cups in a horizontal position.

ERRATUM

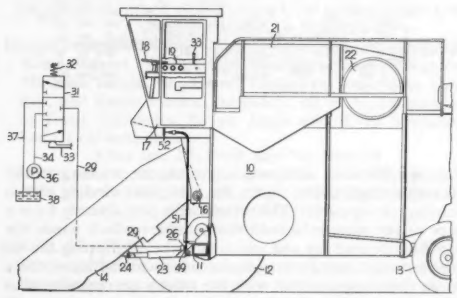
For Class 54—6 see:
Patent No. 3,604,183

3,604,185
MECHANISMS FOR DRIVING THE CUTTER ELEMENTS OF A ROTARY MOWING MACHINE
Walter E. Reber; Adrien J. Formery, and Wilhelmus H. Van den Heuvel, all of Saverne, France, assignors to Kuhn Freres & Cie, Paris, France
Filed Nov. 18, 1968, Ser. No. 776,606
Claims priority, application France, Dec. 22, 1967, 133.567
Int. Cl. A01d *35/26*
U.S. Cl. 56—12.7 **7 Claims**



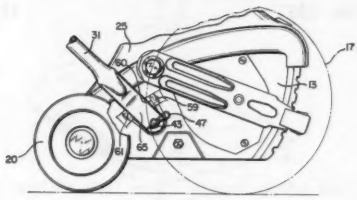
Device for driving the cutter elements of a rotary mowing machine comprising a main bar consisting of a case made of two halves or sections assembled, the upper section having secured thereto the mowing machine driving member and the bearing blocks of the spindles of the pinions driving the discs supporting said cutter elements, and of toothed intermediate wheels of said transmission, characterized in that the bearing blocks or supports of at least two intermediate wheels disposed between two driving pinions are reinforced by a flat bridge piece rigidly secured to, and interconnecting, the lower ends of said bearing blocks, said bridge piece being thus adapted to rigidly assemble the fastening studs of said bearing blocks.

3,604,186
COMBINE HARVESTER
Martin W. Coleman, Independence, Mo., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Jan. 19, 1970, Ser. No. 3,996
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 **6 Claims**



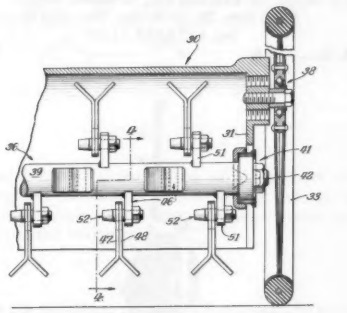
A combine harvester having a pivotally mounted header including a hydraulic ram for raising and lowering the header. A valve mounted on the hydraulic cylinder communicating with the hydraulic system for permitting raising of the header when the hydraulic system is actuated but preventing lowering of the header unless both the hydraulic system is so actuated and a poppet in such valve is moved to a lowering position.

3,604,187
LAWN MOWER HANDLE CONSTRUCTION
Edwin J. Weber, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.
Filed Oct. 1, 1969, Ser. No. 862,685
Int. Cl. A01d *55/20*
U.S. Cl. 56—249 **4 Claims**



A lawn mower including a housing supported for movement by ground engaging wheels. A motor driven wheel is rotatably supported upon the housing and cooperates with a bed knife to cut grass. A handle is inclined upwardly from the housing to facilitate manipulation and control of the mower. The handle is adapted to be moved into a generally vertical position relative to the housing and/or to be folded intermediate its length for mower storage.

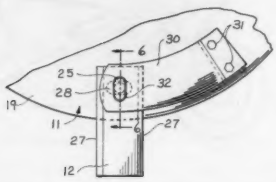
3,604,188
CUTTING BLADE ATTACHMENT FOR A MOWER
Carl W. Mott, Lake Ozark, Mo., assignor to Mott Corporation, La Grange, Ill.
Filed Oct. 31, 1969, Ser. No. 872,935
Int. Cl. A01d *55/22*
U.S. Cl. 56—294 **21 Claims**



This disclosure deals with a mower including means for removably attaching cutting blades to a rotatable shaft of the mower. The mower includes a generally horizontal rotatable shaft, means for rotating the shaft at a high speed, a plurality of cutting blade supports secured to the shaft, and one or more cutting blades attached to each of the blade supports. The supports are angularly and circumferentially spaced along the length of the shaft so that, upon rotation of the shaft, the blades cut a swath which is substantially continuous over the length of the shaft. Each blade support includes a member which is supported at one end only, a generally circular central portion which carries the blades during mower operation, and a free end portion which includes an offset or protrusion, thus forming an out-of-round cross section. Each blade has a hole formed therein, which is shaped to permit the blade to be slipped over the protrusion of the free end

portion when the blade is placed at a certain angle relative to the free end portion. Once past the free end portion, the blade is moved to the central portion of the member, and its swings loosely on the central portion. The protrusion of the free end portion then retards accidental removal of the blade from the member.

3,604,189
KNIFE MOUNTING ON A ROTARY MOWER
Delmar C. Harer, New Holland; Charles B. Adams, New Holland, Pa., and Nigel W. Meek, Long Crendon, England, assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Sept. 18, 1969, Ser. No. 859,100
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **11 Claims**

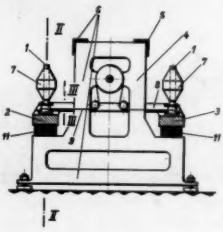


A rotary mower has a plurality of supporting discs longitudinally spaced with cutting knives mounted adjacent to the periphery of the supporting disc. The individual knives have elongated slots fitting over elongated heads spaced from and securely fastened to the discs by cylindrical portions of an attaching bolt and interlock with the attaching bolt when the knives extend to radial cutting positions. Resiliently springs are attached to the supporting discs forwardly of the respective knives in the direction of rotation and have openings fitting over the elongated heads to hold the knife on the cylindrical portions of the attaching bolt as it pivots about the attaching bolt.

3,604,190
PECAN PICKER
Jimmy B. Wray, Ft. Belknap Rd., Graham, Tex.
Filed Feb. 20, 1970, Ser. No. 13,074
Int. Cl. A01d *51/00*
U.S. Cl. 56—328 R **8 Claims**

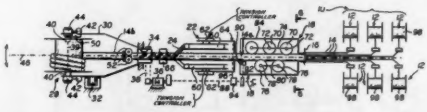
A rotary article pickup assembly for rolling over the ground to collect, pick up and retain small generally round articles lying upon the ground. The assembly includes at least one journaled pickup member for rolling along the ground while being urged downwardly relative to the ground and the pickup member defines a plurality of generally U-shaped members disposed in a circle about the center axis of rotation of the pickup member and the U-shaped members open toward the center axis and are disposed generally in radial planes of the center axis. The U-shaped members are stiff but resiliently supported for relative movement of the radial outermost portions of adjacent U-shaped members toward and away from each other and the normal spacing between the outer ends of adjacent U-shaped members is such that rolling engagement of the pickup member over a small generally round article such as a nut lying upon the ground will cause the outer ends of the adjacent U-shaped members to be spread apart for the passage of the nut therebetween and into the annular area about the center axis bound by the U-shaped members.

3,604,191
TWISTING MACHINE
Rudolf Jaeggli, Bern, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland
Filed May 12, 1969, Ser. No. 823,803
Claims priority, application Switzerland, May 20, 1968, 7682/68
Int. Cl. D01h *1/14, 7/10*
U.S. Cl. 57—1 **14 Claims**



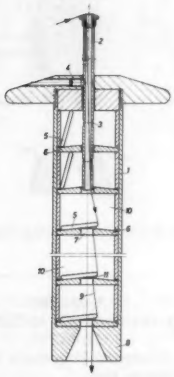
The spindles of the twisting machine are mounted on spindle rails which are directly or indirectly mounted on the machine frame by omnidirectally acting damping members such as rubber pads. In addition, a cover can be disposed about the spindle rails and spindle drives to damp noise. Finally, a damping element can be secured about the spindle rail to damp noise.

3,604,192
TELEPHONE CABLE ASSEMBLY SYSTEM
Oscar G. Garner, Riverside, Conn., assignor to General Cable Corporation, New York, N.Y.
Continuation-in-part of application Ser. No. 524,243, Feb. 1, 1966. This application July 30, 1969, Ser. No. 846,074
Int. Cl. H01b *13/02, 13/08*
U.S. Cl. 57—3 **7 Claims**



This specification discloses apparatus for winding strand units into a single cable, taping the cable and winding it on a revolving takeup cabler. The strand units pass directly from a spacer or lay plate to a twist compensator which winds the cables to a desired lay and which has wheels gripping the assembled strand units from opposite sides with sufficient force to twist them together but with the wheels on opposite sides of the cable staggered so that the strand units can move with respect to one another as they are twisted into the cable. The takeup cabler spool rotates about its axis to wind the cable and the spool also rotates on an axis about which the strand units are twisted and rotates at the same speed as the twist compensator or at a slightly higher speed. The apparatus is reversible.

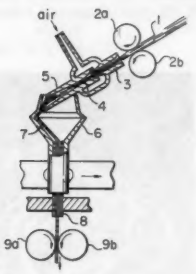
3,604,193
YARN BRAKE
Anton Welbers, and Karl Ring, both of Wildtal, near Frieburg im Breisgan, Germany, assignors to Rhodeaceta A.G., Freiburg im Breisgan, Germany
Filed June 30, 1969, Ser. No. 837,860
Claims priority, application Germany, June 29, 1968, P 17 60 769.1
Int. Cl. D01h 7/86, 13/10; B65h 59/20
U.S. Cl. 57—58.86 12 Claims



A yarn brake comprises at least one compartment, the bottom wall of which rises towards the center conically, and a small round plate in the compartment capable of resting on the bottom wall. The conduit for the yarn is in the middle of the bottom wall. The diameter of the plate is greater than the height of the compartment and is such, with respect to the width of the brake, that, when the plate rests on the bottom wall, the conduit for the yarn is covered. Preferably more than one compartment is present, and the brake is provided with a tube in the middle, the level of which is adjustable, so that the number of compartments which enter into operation, is controllable.

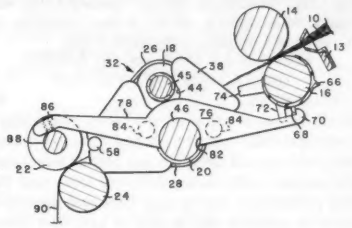
3,604,194
FIBER SUPPLY METHOD AND APPARATUS IN AN OPEN-END SPINNING SYSTEM UTILIZING AIRFLOW AND CENTRIFUGAL FORCE
Hiroshi Edagawa, Shiga-ken; Keiichi Minami, Shiga-ken; Kozo Susami, Shiga-ken; Masakazu Hirota, Shiga-ken; Masaaki Tabata, Shiga-ken; Toshimoto Matsubara, Shiga-ken, and Kunio Shinkai, Aichi-ken, all of, Japan, assignors to Toray Industries, Tokyo, Japan and Howa Machinery, Ltd., Aichi-ken, Japan
Filed Jan. 27, 1969, Ser. No. 794,101
Claims priority, application Japan, Jan. 30, 1968, Jan. 30, 1968, Mar. 4, 1968, Mar. 11, 1968, 43/5657;43/5658;43/1 3610;43/15388
Int. Cl. D01h 1/12
U.S. Cl. 57—58.89 6 Claims

Disclosed herein is a method and apparatus for use with yarn-spinning equipment wherein individual fibers are extracted from a bundle of fibers delivered from a supply source at a position in a fiber supply device where the fluid speed of the airstream for conveying the fibers is maximum, while the bundle of fibers is still gripped by the supply source. In the present invention, a distance between the nip point of the supply source and the above-mentioned position is particularly defined with respect to the staple length of the spinning material. Furthermore, preferable shapes are illustrated for the fiber guide conduit, the fiber-separating



passage, and the fiber supply conduit of the fiber supply device for producing a high quality yarn.

3,604,195
DRAFTING APPARATUS
Grady H. Sanders, and Robert M. Ingham, Jr., both of Spartanburg, S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.
Filed July 1, 1969, Ser. No. 838,212
Int. Cl. D01h 13/18
U.S. Cl. 57—87 5 Claims

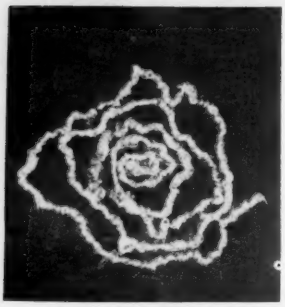


An apparatus to stop the supply of roving to a drafting system when an end breaks to prevent lap damage to the drafting system by physically rotating a stop member into the path of flow of the roving supply.

3,604,196
METHOD OF MAKING LATENTLY CRIMPABLE YARN FROM POLYBLEND AND PRODUCT
Dusan C. Prevorsek, Morristown; George E. R. Lamb, Mendham; Krishnan Thiruvillakkat, Parsippany, and Hendrikus J. Oswald, Morristown, all of, N.J., assignors to Allied Chemical Corporation, New York, N.Y.
Filed July 10, 1969, Ser. No. 840,759
Int. Cl. D02g 1/20, 3/02
U.S. Cl. 57—140 6 Claims

A multifilament fine denier latently crimpable yarn from a polymeric blend of incompatible thermoplastic polymers such as a polycaproamide/polyethylene terephthalate and/or polypropylene blend; and process of producing it. The process involves subjecting a monofil, film or tape of the polymer blend, in semiamorphous state, to a rolling pressure applied progressively down the length against one crosswise dimension, and then applying a transverse force gradient

preferably created by impelling the structure in a high velocity gas stream against a deflecting surface. The crimp is



preferably developed by exposing the split yarn under low tension to hot gas or vapor.

3,604,197

MULTICOLORED YARNS MADE FROM BLEND OF DIFFERENT DENIER FIBERS

Hideto Sekiguchi, Saidaiji-City; Tomohide Matsumoto, Saidaiji-City; Masanobu Hoten, Saidaiji-City, and Hideo Kawasaki, Nishinomiya, all of, Japan, assignors to American Cyanamid Company, Stamford, Conn.

Filed July 15, 1969, Ser. No. 842,019

Int. Cl. D02g *1/18, 3/02, 3/24*

U.S. Cl. 57—140 BY **10 Claims**

Multicolored yarns comprising a blend of (a) first fibers of first denier and color and (b) second fibers of second denier and color, said second denier being higher than said first denier, said second color being different from said first color, the blend proportions being such that said second fibers do not exceed in quantity the weight of said first fibers in said blend, and the two deniers having a mathematical relationship, one to the other.

3,604,198

PRODUCTION OF WORSTED-SPUN YARNS

Frank Alfred Greenwood, Burley-in-Wharfedale, England, assignor to T.M.M. (Research) Limited, Lancashire, England

Filed Feb. 28, 1969, Ser. No. 803,419

Int. Cl. D01h *5/00, 5/02;* **D01g** *29/00*

U.S. Cl. 57—156 **12 Claims**

A process for producing worsted-spun yarn by a drawing process including two stages of drawing wherein the last drawing step includes autolevelling and the roving is fed from the last drawing step to a ring-spinning operation.

3,604,199

PLURALITY END CRIMPING

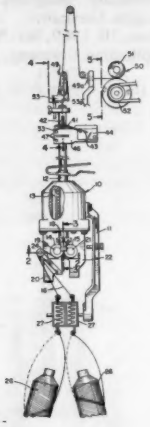
Eugene Torello-Viera, Claymont, and Alexander L. Trifunovic, Wilmington, both of, Del., assignors to Joseph Bancroft & Sons Co., Wilmington, Del.

Filed Apr. 3, 1969, Ser. No. 813,031

Int. Cl. D02q *3/28*

U.S. Cl. 57—157 **3 Claims**

The method of crimping yarn in a stuffer crimper wherein two or more ends are introduced side by side into the crimper chamber to form cores of crimped filaments which are advanced together through the crimper. The crimped ends are extracted from the respective cores at the discharge end of the crimper, and are combined and wound together



onto a winding to form a yarn composed of readily identifiable ends.

3,604,200

ALARM-CLOCK HAVING AN ARTIFICIAL CENTER OF GRAVITY

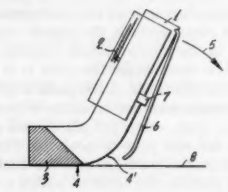
Richard Sapper, Stuttgard Degerioch, Germany, assignor to Italora S.P.A., Milan, Italy

Filed Dec. 30, 1969, Ser. No. 889,084

Claims priority, application Italy, Dec. 31, 1968, 25773 A/68

Int. Cl. G04h *37/12*

U.S. Cl. 58—21.15 **6 Claims**



An alarm-clock comprising a supporting member for the clock device and a counterweight adjacent the base of said supporting member, the said base for the supporting member having an end portion upward facing and connected with the upper portion for enabling said member to oscillate as a result of a balance disturbing action between balance and inclined positions. At least one control lever is attached to said supporting member, and is operated by its abutment with the clock bearing plane because of said oscillation, the base shape and counterweight position being such as to cause the clock to move back to and be held at its balance position, when the disturbing action is stopped or removed.

3,604,201

METHOD OF DRIVING THE GEARING OF AN ELECTRONIC TIMEPIECE AND AN ELECTRONIC TIMEPIECE FOR IMPLEMENTING SAID METHOD

Peter Dome, Athenaz/Geneva, Switzerland, assignor to Societe Suisse Pour L'Industrie Horlogere S. A., Geneva, Switzerland

Filed July 2, 1969, Ser. No. 838,422

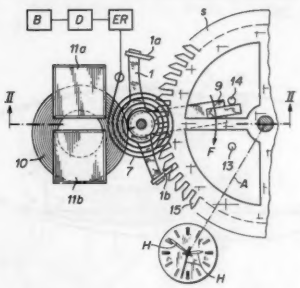
Claims priority, application Switzerland, July 9, 1968, 10220/68

Int. Cl. G04c *3/00*

U.S. Cl. 58—23 **7 Claims**

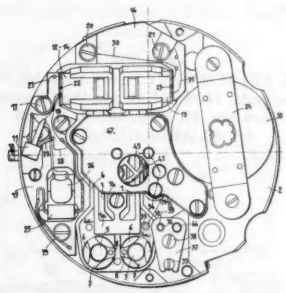
An electronic timepiece comprises a device for indicating the time, which device includes a gear train and a time in-

dicator controlled by said gear train, an electronic circuit which produces periodic signals of a predetermined frequency and an electromechanical transducer for driving said device, which transducer is controlled by the signals produced by the said circuit; the transducer incorporates a member which swings periodically and at the frequency of



said signals, between two limiting positions in order, at least once during the course of two successive swings, to strike successively each tooth of a gear in the said gear train; means are provided in order to limit to a predetermined value the angular displacement of the gear as a consequence of each impact.

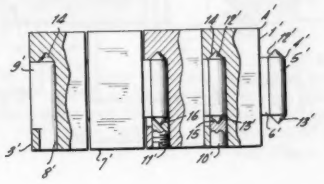
3,604,202
ELECTRIC TIMEPIECE
Rene Besson, and Remy Chopard, both of Neuchatel, Switzerland, assignors to S Ebouches S. A., Neuchatel, Switzerland
Filed Aug. 14, 1969, Ser. No. 849,987
Claims priority, application Switzerland, Aug. 30, 1968, 13,113/68
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 R **2 Claims**



The present invention relates to an electric timepiece with a driving regulator mechanism, the oscillations of which are electrically sustained by means of a transistorized circuit comprising at least two windings, i.e. a pickup winding and a driving winding.

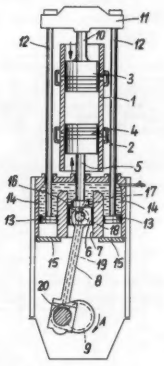
This timepiece is characterized by the fact that it comprises two winding carrying plates on each of which is secured one of these windings, one of the said plates carrying moreover the transistor or transistors as well as at least one part of the other elements of the sustaining circuit.

3,604,203
LINK BRACELET
Detlef Hofmann, Kieselbronn, Germany, assignor to Rodi & Wienenberger Aktiengesellschaft, Pforzhein, Germany
Filed Oct. 21, 1968, Ser. No. 769,019
Claims priority, application Germany, Oct. 28, 1967, P 15 57 633.9
Int. Cl. F16g *13/00*
U.S. Cl. 59—80 **10 Claims**



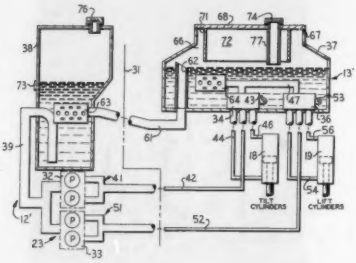
A link bracelet is formed which comprises a plurality of links flexibly connected to one another by connection means which comprises a projection extending from the end of each link and a mating recess disposed near the other end of each link so that the projections can mate with the recesses in adjacent links and means for securing the projection in the recess while permitting flexibility of the bracelet.

3,604,204
COUNTERPISTON MACHINE, ESPECIALLY COUNTERPISTON MOTOR
Hans-Joachim Conrad, and Peter Muller, both of Essen, Germany, assignors to Fried Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Mar. 18, 1970, Ser. No. 20,738
Claims priority, application Germany, Mar. 22, 1969, P 19 14 717.2
Int. Cl. F02b *41/00*
U.S. Cl. 60—19 **4 Claims**



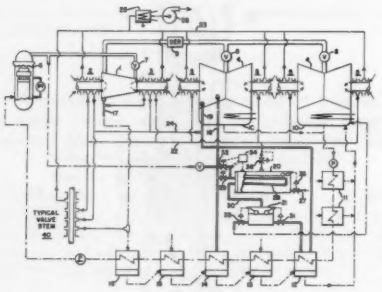
A counterpiston machine, preferably counterpiston motor, in which at least two displacement pistons are, by pull rods and a transverse yoke, connected with a counterpiston, and in which the liquid columns acted upon by said counterpistons communicate with a chamber in which these columns act upon the annular surface of a piston connected to a piston rod with another counterpiston which latter is formed by a crosshead or is connected thereto.

3,604,205
HYDRAULIC FLUID CIRCUIT
Thomas H. Geselbracht, Joliet, and David S. Vinton, Morton, both of, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed June 19, 1969, Ser. No. 834,776
Int. Cl. F15b *15/18, 1/06*
U.S. Cl. 60—52 HE **11 Claims**



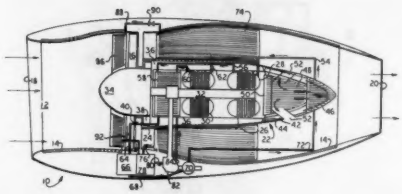
A hydraulic circuit having one or more pumps adjacent motor means in a machine with hydraulic motors which are supplied by the circuit being located in a relatively remote location from the pumps. A control valve is associated with each hydraulic motor and includes a return line in communication with a first hydraulic fluid tank. An assembly of one or more pumps for delivering fluid under pressure to the control valves is located adjacent the motor means and is driven by the motor means. A second hydraulic fluid tank is associated with the pump assembly, the second tank providing fluid to the pumps and being in communication with the first tank by a return conduit for delivering fluid from the first tank to the second tank. To prevent rupture of the first tank, a baffle is preferably arranged within that tank to assure a constant air pocket above the fluid.

3,604,206
SHAFT-SEALING SYSTEM FOR NUCLEAR TURBINES
Frederick G. Baily, Ballston Spa, N.Y., assignor to General Electric Company
Filed July 31, 1968, Ser. No. 749,077
Int. Cl. F01d
U.S. Cl. 60—108 **5 Claims**



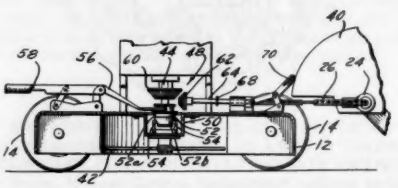
A nonradioactive source of steam for sealing the shaft packings of turbines operating on steam subject to nuclear contamination is generated by a special steam seal evaporator. The nonradioactive steam is supplied to the high-pressure shaft packing chamber as a buffer between contaminated steam and the atmosphere, and prevents mixing of contaminated steam with air extracted from the packings. The evaporator is heated by steam extracted from the turbine for maximum cycle efficiency. Clean sealing steam is generated at a pressure above atmospheric and eliminates conventional steam seal regulator devices. The system eliminates radioactive contamination of the air drawn from the turbine packings, reducing the size of the station off-gas system.

3,604,207
VAPOR CYCLE PROPULSION SYSTEM
Jack P. Waidelich, Bonita, Calif., assignor to Rohr Corporation, Chula Vista, Calif.
Filed June 1, 1970, Ser. No. 41,864
Int. Cl. F02k *3/04, 5/00;* **F01k** *23/18*
U.S. Cl. 60—262 **15 Claims**



System comprises duct with entire powerplant within duct. Axial flow compressor driven by multiple vapor turbines produces entire thrust in form of airflow. Combustor uses minor portion of airflow to combine with fuel and burn to produce heat to vaporize highest temperature boiling working fluid, such as mercury. In two turbine system, first fluid operates first turbine and exhaust goes to heat exchanger which condenses mercury vapor and boils second fluid such as water thus producing water vapor. This water vapor operates second turbine which is coupled to first turbine. Exhaust from second turbine goes to condenser in airflow so that all rejected heat is added to airflow within duct to increase its energy. Can use two or more fluids with successively higher boiling points. Combustion gases may also pass from mercury vaporizer to water preheater and superheater and then discharge into airflow to add remaining heat energy. Vaporizer, turbines, and heat exchangers, except water condenser, all within a center body to further conserve heat. Combustion gases mix with air within duct so there is no primary combustion gas jet. High velocity of airflow is still much lower than turbojet, producing considerable noise reduction. All heat rejected or lost goes into airflow to produce maximum efficiency. Relatively low temperature makes possible maximum use of acoustic surfaces inside duct. High cycle efficiency will result in low hydrocarbon exhaust emission.

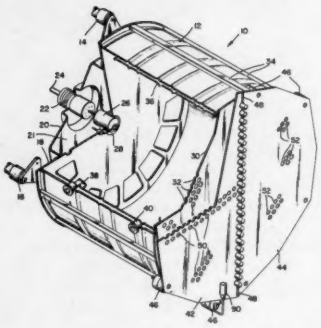
3,604,208
EDGER ATTACHMENT FOR LAWN MOWERS
William C. Borunda, 1606 Delvale St., West Covina, Calif.
Filed Apr. 10, 1970, Ser. No. 27,300
Int. Cl. A01d *35/26, 53/14*
U.S. Cl. 56—11.5 **8 Claims**



This disclosure relates to lawn care apparatus, and more particularly to a combination mower/edger. Both units are driven by a single motor and can be operated either singly or in combination. The edger portion is simplified by being driven by a flexible shaft and is adapted to be positioned on either side of the mower, depending upon the convenience of the operator. Moreover, the edger may be tilted relative to

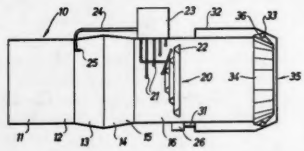
the mower for a desired angle of edging, or to compensate for the slope of the ground.

3,604,209
ION BEAM DEFLECTION SYSTEM
Harry J. King, Woodland Hills, and James W. Ward, Santa Monica, both of, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Dec. 23, 1968, Ser. No. 786,300
Int. Cl. F03h 5/00; F02k 1/20
U.S. Cl. 60—202 8 Claims



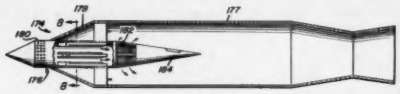
An ion beam device has a plurality of laterally spaced perforated accelerator electrodes, with the electrodes connected to different negative potentials so that ions discharged out of the perforations along the separating line are deflected. Preferably, these perforations along the separating line are equipped with half-cylindrical tubes to enhance the electrostatic deflection of the beamlets passing through the apertures. Thus, a net deflection of the discharge ion beam is obtained.

3,604,210
GAS TURBINE ENGINE
Christopher Linley Johnson, Derby, England, assignor to Rolls-Royce Limited, Derby, England
Filed Aug. 15, 1969, Ser. No. 850,446
Claims priority, application Great Britain, Aug. 30, 1968, 41555/68
Int. Cl. F02k 1/16, 1/18, 3/10
U.S. Cl. 60—237 10 Claims



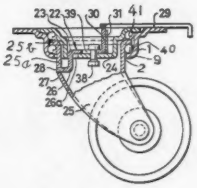
The invention concerns a gas turbine engine having a jet pipe which is provided with reheat combustion equipment and with a variable area nozzle, a pressure-responsive device which controls the area of the nozzle during reheat operation of the engine and which is adjusted in functional dependence upon the value of the jet pipe pressure, fuel supply control means for controlling the supply of fuel to the reheat combustion equipment, a manually operable member for adjusting the quantity of fuel supplied by the fuel supply control means, and biassing means, operated on adjustment of the manually operable member to select and increase reheat, for biassing the pressure-responsive device so that the latter initially adjusts the area of the nozzle at a rate at least sufficient to prevent an appreciable rise of jet pipe pressure.

3,604,211
COMBINED PULSE JET AND VARIABLE RAM JET ENGINE
John N. Ghougasian, 666 West 188th St., New York, N.Y.
Continuation-in-part of application Ser. No. 822,980, May 8, 1969, now Patent No. 3,533,239. This application Sept. 12, 1969, Ser. No. 857,497
Int. Cl. F02k 7/06, 7/10
U.S. Cl. 60—244 7 Claims



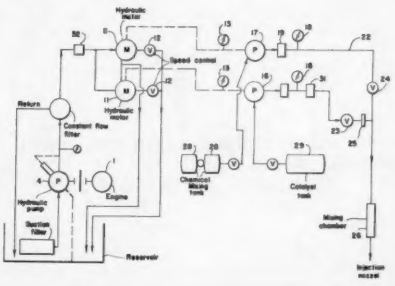
A reaction thrust engine operating in a pulse jet mode to attain cruising speeds, is converted to ram jet operation by variations in the internal flow controlling geometry and location of the combustion zone. This is accomplished by an axially shiftable center body and a tubular check valve assembly.

3,604,212
CASTER WHEEL ARRANGEMENT WITH LOCKING DEVICE
Gunnar Erick Werner Lewin, Viggbyholm, Sweden, assignor to AB Lyckeaborgs Bruk, Torskors, Sweden
Division of Ser. No. 684,160, Nov. 20, 1967
Filed June 2, 1969, Ser. No. 829,250
Int. Cl. B60b 33/00
U.S. Cl. 16—35 2 Claims



A caster wheel arrangement is provided with means for simply and releasably locking the pivotal movement of the wheel fork in any one of a number of positions so as to cause the rolling movement to be in a desired direction.

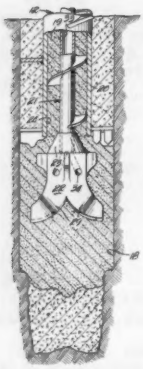
3,604,213
CHEMICAL GROUTING PROPORTIONING PUMPING METHOD AND APPARATUS
Herbert Leland Parsons, P.O. Box 46, Georges Rd., Franklin Park, N.J.
Continuation of application Ser. No. 651,612, July 6, 1967. This application Jan. 10, 1969, Ser. No. 790,418
Int. Cl. E02d 3/12
U.S. Cl. 61—36 7 Claims



Grouting reactants are mixed from separate supplies before delivery by driving a hydraulic pump and creating a con-

stant flow of hydraulic fluid, dividing the hydraulic flow into two rotary hydraulic motors, controlling the hydraulic exhaust of those motors individually to establish a rotation ratio of the motors, and mechanically coupling each of the motors to a rotary pump for pumping a grouting reactant. Thereby the ratio of grouting reactants is precisely controlled. The speed of the hydraulic motors are controlled according to flow meters adjacent the reactant pumps so that the desired flow ratio of reactants is established. An overpressure switch in one of the reactant pump discharge lines cuts off hydraulic fluid to both hydraulic motors so that the single operator may shut down the reactant pumps simply by shutting off a valve in a discharge line far removed from the pumps.

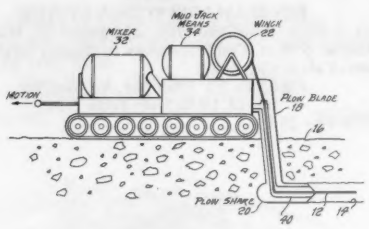
3,604,214
MEANS AND METHOD OF MAKING COLUMNAR STRUCTURES IN SITU
Lee A. Turzillo, 2078 Glengary Rd., Akron, Ohio
Continuation-in-part of application Ser. No. 441,053, Mar. 19, 1965, now Patent No. 3,426,538, dated Feb. 11, 1969. This application Aug. 16, 1968, Ser. No. 763,047
Int. Cl. E02b *5/34, 15/04*
U.S. Cl. 61—53.64 **31 Claims**



Method and means for providing pile or other structural column in earth situs, includes screwing hollow shafted auger into situs to form bore, and smaller auger is selectively axially shifted in the hollow shaft to move closure carried by smaller auger to selectively adjusted spacing of closure from closed position against inner end of hollow shaft. Larger auger progressively withdrawn from bore while rotating smaller auger in hollow shaft, forcibly to convey bore filling material through hollow shaft, past closure and be dispersed and compacted within the bore. Other means provided, separately supplying fluid material to bore through shaft of smaller auger for combination with materials conveyed into bore by auger flighting. Axially shiftable auger variously operable ahead of larger auger to test soil at different levels and/or to facilitate drilling use of larger auger.

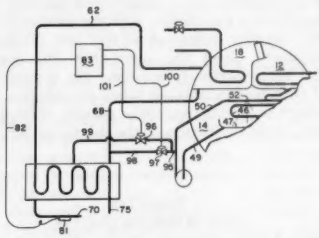
3,604,215
METHOD OF LAYING ELECTRICAL CABLE
Cletus M. Dunn, Waterford, Conn.
Filed Jan. 20, 1970, Ser. No. 4,250
Int. Cl. E02f *1/00, 5/10*
U.S. Cl. 61—72.2 **2 Claims**

Means for and method of laying electrical cable underground and providing a high-conductivity environment therefor, consisting of a cable plow machine plus means to fill the excavated tube in which the cable is laid with a conductive mortar under hydraulic pressure. The latter means include a mixer for mixing the loose soil with a conductive aggregate, cement, water, moisture-attracting gel and a water



reduction admixture and mud jack means for forcing the mortar into the excavated tube under pressure.

3,604,216
CRYSTALLIZATION PREVENTION CONTROL FOR ABSORPTION REFRIGERATION MACHINE
James M. Porter, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.
Filed Sept. 9, 1969, Ser. No. 856,274
Int. Cl. F25b *15/06*
U.S. Cl. 62—141 **5 Claims**

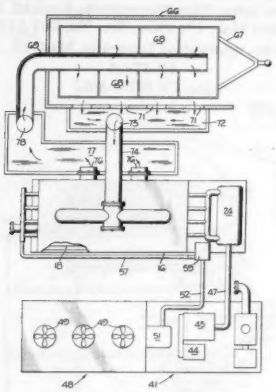


A control switch senses impending crystallization in an absorption refrigeration machine to prevent solidification of absorption solution in critical areas of the machine. A sensing element senses a rise in the temperature of the concentrated absorption solution leaving the solution heat exchanger, which temperature rise is indicative of impending crystallization. This sensor can actuate a plurality of controls which will cause dilution of the concentrated solution in the heat exchanger or other crystallization prone areas. When the temperature of the concentrated solution leaving the solution heat exchanger falls below a predetermined level after decrystallization has occurred, additional automatic controls are actuated to initiate a dilution and shutdown cycle.

3,604,217
PORTABLE REFRIGERATOR FOR VACUUM AND WATER COOLING
John C. Spear, San Francisco, Calif., assignor to Mobile Products Services, Inc.
Filed Oct. 8, 1969, Ser. No. 864,749
Int. Cl. F25b *19/00*
U.S. Cl. 62—268 **5 Claims**

A refrigerator is mounted on a vehicle and is used for water cooling or for vacuum cooling alternatively. A pressure-resistant enclosure contains refrigerator coils. A pump drawing from auxiliary equipment circulates refrigerant through the refrigerator coils. Air under subatmospheric pressure or water is admitted to the top of the enclosure and is evenly distributed to flow down over the coils. The air is

pumped out of the enclosure and the water is drained from the floor of the enclosure. Auxiliary equipment recirculates



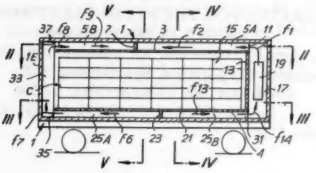
the drained, cooled water over produce or evacuates the enclosure and any connected chamber.

3,604,218

INSULATED CONTAINERS FOR PERISHABLE GOODS

Piero Cresti, Basel, Switzerland, assignor to Societe Ferroviaire Internationale de Transports Frigorifiques Interfrigo, Societe Cooperative, Bruxeltes, Belgium

Filed Apr. 15, 1970, Ser. No. 28,713
Claims priority, application Belgium, Apr. 21, 1969, 73018
Int. Cl. F25d *17/04*
U.S. Cl. 62—408 **10 Claims**



An insulated container for perishable goods comprises a pair of convergent passages defined by the upper wall of the container, a pair of convergent passages defined by the lower wall of the container and sets of channels open to the interior of the container formed in the respective sidewalls of the container, the channels extending between the convergent passages. When the container is filled with a load impervious to air, air is circulated through the passages and channels around the load. When the container is filled with a previous load, air is circulated through the channels and passages and passes through the load directly from one set of passages to the other.

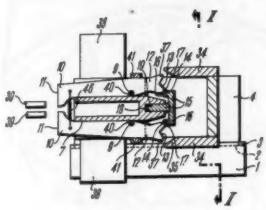
3,604,219

PATTERN-KNITTING MACHINE

Karl Flad, Hauptrasse 29, Undingen, Germany

Filed Feb. 27, 1969, Ser. No. 802,931
Claims priority, application Germany, Mar. 5, 1968, P 16 35 805.7
Int. Cl. D04b *15/66*
U.S. Cl. 66—154 **27 Claims**

Apparatus for controlling the jacks of a pattern-knitting machine such as a Jacquard machine comprises a displaceable striker bed which is intended to be substituted for the periodically displaced rail which effects displacement of selected jack means in a conventional machine, striker means pivotally mounted on said striker bed, said striker means having striker faces at one end for engagement with said jack means, a detaining device movable into engagement with said striker means at a location remote from said striker faces, means to pivot said striker means for moving said striker faces into a predetermined position prior to said striker bed being moved towards said jack means, said detaining device being arranged to be moved into a striker means locking position when said striker faces are in a selected position relatively to said jacks means prior to said striker faces engaging said jack means, and means for deriving said movement of said striker faces and of said detaining device from said periodic displacement of said striker bed.

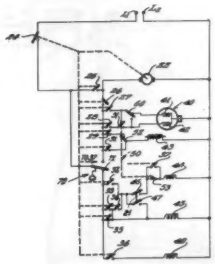


3,604,220

CONTROL CIRCUIT FOR AUTOMATIC WASHING MACHINE

Raymond F. Taylor, Stevenville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 20, 1969, Ser. No. 808,845
Int. Cl. D06f *33/02*
U.S. Cl. 68—12 **6 Claims**



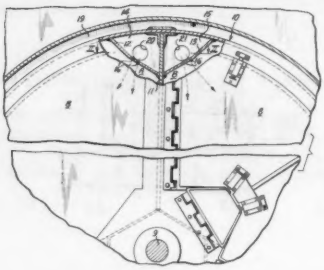
An automatic washer or combination washer-dryer of the coin-operated type provides the operator with selection of a normal washing cycle or a permanent-press washing cycle through the expediency of a single manually operable multiposition switch. A timer establishes operating circuits for the electrically energized washer components on the basis of a single preset program while the multiposition switch prepares these circuits for completion in accordance with the selected washing cycle. In addition, a separate switch is included in the control circuit for selection of motor speed to provide additional flexibility of washing control.

3,604,221

WASHING MACHINE EQUIPPED WITH SPRINKLER FOR USE IN LOADING

Norvin Pellerin, New Orleans, La., assignor to Pellerin Milnor Corporation, Kenner, La.

Filed Aug. 12, 1969, Ser. No. 849,939
Int. Cl. D06f *33/02, 39/08*
U.S. Cl. 68—12 R 8 Claims



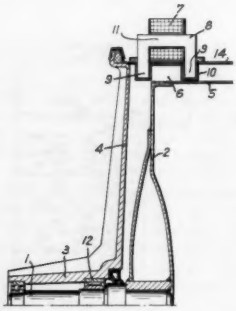
A washing machine with means for sprinkling the clothing being loaded to reduce its bulk.

3,604,222

STATOR ARRANGEMENT

Werner Wutherich, Sandkrug; Edgar Zelle, Rastede, and Heino Gerke, Oldenburg, all of, Germany, assignors to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt am Main, Germany

Filed May 12, 1969, Ser. No. 823,782
Claims priority, application Germany, May 11, 1968, P 17 60 382.6
Int. Cl. H02k *1/24*; D06f *37/36*
U.S. Cl. 68—24 7 Claims



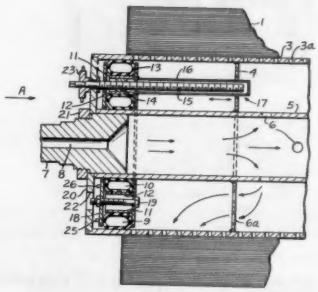
A drum-type washing machine includes a drum and an electric motor including a rotor which has a diameter approximately equal to that of the drum and a plurality of salient pole pieces made of soft magnetic material positioned at uniformly spaced angular positions about the rotor, and a segmented stator mounted on the support means and facing only a portion of the circumference of the rotor, the stator including a plurality of separate windings. Each of the stator windings is supplied with electric current at intervals in dependence of the position of the rotor in order to exert a reactance torque on the poles.

3,604,223

CENTRIFUGAL WINDING DRUM FOR THE WET AND GAS TREATMENT OF TEXTILE WEB MATERIAL

Werner Packschies, Krefeld, and Karl-Peter Lopata, Krefeld-Gartenstadt, both of, Germany, assignors to Joh. Kleinewefers Sohne Maschinenfabrik, Krefeld, Germany

Filed Mar. 17, 1969, Ser. No. 807,510
Claims priority, application Germany, Mar. 15, 1968, P 17 10 474.4
Int. Cl. B05c *8/02*
U.S. Cl. 68—150 7 Claims



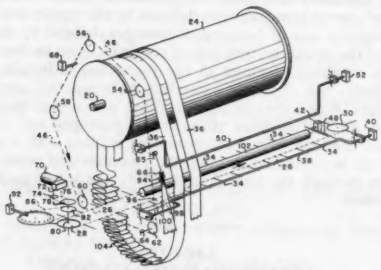
A centrifugal drum for treating web material by means of a liquid or gaseous substance, in which the marginal areas of a hollow drum with a perforated circumferential drum wall are gas or liquid tight sealed by inflatable hose means arranged within said hollow drum between the latter and a hollow shaft having said drum connected thereto for rotation therewith, said hoses also sealingly engaging said hollow shaft and being adjustable in the axial direction of said shaft.

3,604,224

APPARATUS FOR THE FLUID TREATMENT OF FABRICS IN ROPE FORM

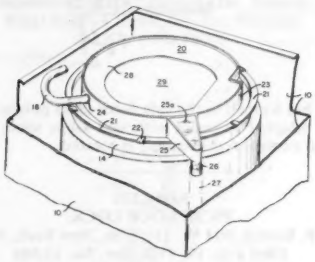
Charles L. Beasley, Clemson, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 23, 1970, Ser. No. 21,586
Int. Cl. D06f *43/08*; G11b *15/28*
U.S. Cl. 68—176 12 Claims



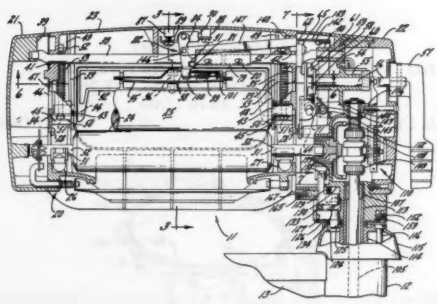
Apparatus to fluid treat a plurality of pieces of fabric sewn together and made into rope form. The rope is caused to follow a helical path in the apparatus by the use of an endless conveyor which is operated intermittently to move the fabric longitudinally of the fluid-treating chamber.

3,604,225
WASHING MACHINE TUB COVERS
Peyton W. Douglas, Bemus Point, N.Y., assignor to Blackstone Corporation
Filed June 20, 1969, Ser. No. 835,012
Int. Cl. D06f *39/00*
U.S. Cl. 68—23.5 8 Claims



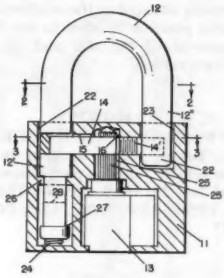
An annular cover mounted on top of a clothes washer outer tub and extending inwardly over the clothes basket to contain the splashing of water created by the action of the agitator and to safeguard any overflow onto the base of the cabinet created by a defective water level switch or faulty timer or water valve, the cover having an annular rim engaging the outer tub, and a vertical wall terminating in an inwardly extending downwardly sloping annular flange and having an opening in one side leading into a well externally on the tub and a hose securely fastened to this well externally of the tub whereby in a high water condition the trough and hose will create a siphon thereby maintaining a safe water level before it overflows the cover onto the base, the hose fits through a hole in the base or cabinet of the washer.

3,604,226
WRINGER RELEASE FOR LAUNDRY MACHINES
Karlis V. Racenis, Ripon, Wis., assignor to McGraw-Edison Company, Ripon, Wis.
Filed June 9, 1969, Ser. No. 831,519
Int. Cl. D06f *45/00*
U.S. Cl. 68—263 12 Claims



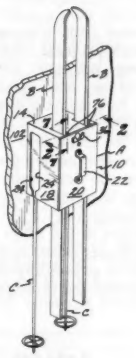
A laundry machine wringer-releasing mechanism having a one release linkage from a manual pressure bar and a second release linkage operated by an eccentric and cam arrangement for releasing the wringer upon excessive sidewise torque on the wringer head, the two linkages being independently operable.

3,604,227
PADLOCKS
Michael Tom Athanason, 13113 Parkland Drive, Rockville, Md.
Filed Aug. 25, 1969, Ser. No. 852,790
Int. Cl. E05b *67/22*
U.S. Cl. 70—38 A 2 Claims



A padlock having a caselock including a tumbler locking mechanism and keyway in the body thereof, and a spring-pressed shackle longitudinally and rotationally arranged in the body. A key-controlled gear bolt is located in the caselock for rotation with the locking mechanism and engagement with and opposite transverse movement of a pair of spaced parallel toothed locking dogs into and out of locking position with the shackle to lock the latter in both open and closed positions.

3,604,228
LOCKING DEVICE FOR SKIS AND SKI POLES
John P. Conlon, 3411 Brayton Ave., Long Beach, Calif.
Filed July 10, 1970, Ser. No. 53,826
Int. Cl. E05b *73/00*; A47f *7/00*
U.S. Cl. 70—58 9 Claims

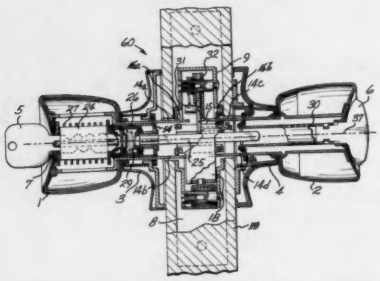


A stationary lockable device for concurrently engaging a pair of skis and ski poles to prevent the unauthorized removal of the same from the device. The lockable device includes a rigid rectangular box that occupies a fixed position, and has a removable door associated therewith. The sides and bottom of the box are slotted to permit the handle portions of a pair of ski poles to be inserted therein, and when so inserted removably gripped by spring-loaded means to prevent a downward movement of the poles relative to the box.

The movable door of the box has ski-engaging means mounted thereon to so support the skis that when the door is

in a closed position the bindings of the skis are within the confines of the box. The skis extend upwardly and downwardly relative to the box through slots formed in the top and bottom thereof. The slots are of sufficiently narrow width that the bindings of the skis cannot pass therethrough. The door is provided with a lock to hold it in a closed position relative to the box, and when the door is so closed wall members are moved within the box to close the pole-handle-receiving openings therein. So long as the door of the box remains in a closed and locked position, the ski poles and skis that are partially situated in the confines thereof are held in a nonremovable position relative to the box, and theft or unauthorized removal of the skis and ski poles from the locking device is prevented.

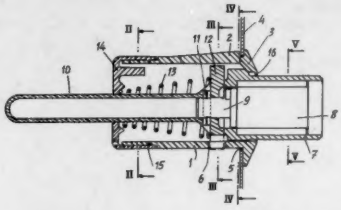
3,604,229
DEAD BOLT AND LATCH DOOR LOCK
Kiyoyasu Wake, Tokyo, Japan, assignor to Tujisash Industries, Ltd., Kanagawa, Japan, a part interest
Filed Jan. 29, 1969, Ser. No. 794,875
Int. Cl. E05b *35/04, 59/02, 3/08;* **E05c** *1/12*
U.S. Cl. 70—107 **27 Claims**



Disclosed is a combination door lock case which includes a latch member and a dead bolt both of which can be selectively projected into a striker plate mounted on a doorjamb. Latch bars extending from doorknobs positioned on each side of the case independently engage individual actuator members within the case, and rotate them about a main axis. Through cam and lever connections, the rotating actuators move the latch member from a temporary latching position, with the latch member projected into the striker plate, to a temporary unlatching position, with the latch member withdrawn into the door. Also in the case is a crank arm which is engageable by a spindle member causing the crank arm to rotate about the main axis as the spindle member is rotated. The end of the crank arm actuates the dead bolt to move it from an extended locking position to a retracted unlocking position with the dead bolt bodily contained within the door. The spindle is attached at one end to a thumb turn member positioned within one of the doorknobs and through a lost motion connector at the other end, the spindle can be actuated by a key cylinder positioned in the other doorknob. Provisions are made for preventing the actuation of the spindle by a picking tool inserted through the keyway of the lock cylinder.

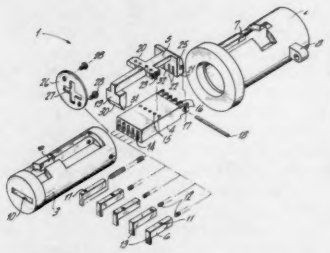
3,604,230
SAFETY CATCH LOCK CONTROL DEVICE
Michel Tixier, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, France
Filed June 30, 1969, Ser. No. 837,589
Claims priority, application France, July 19, 1968, 159,999
Int. Cl. E05b *9/04, 9/08*
U.S. Cl. 70—181 **3 Claims**

Lock control device with safety catch feature, notably for automobile vehicles, of the type comprising a pushbutton and barrel-type lock incorporating a lock control rod slidably mounted in a body adapted to be secured to the vehicle, this device being characterized in that said body has a polygonal cross-sectional configuration, that the pushbutton and control-rod assembly comprises a multilobed portion having a cross-sectional contour corresponding to the inner polygonal configuration of, and adapted to slide in, said body, and that



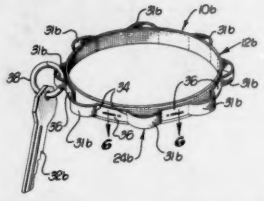
said body has formed in the side faces of its polygonal section apertures adapted to coact with said lobes when said pushbutton and control-rod assembly is rotated.

3,604,231
PICKPROOF LOCK
Feliciano P. Buschi, 504 W. 111th St., New York, N.Y.
Filed Feb. 19, 1970, Ser. No. 12,608
Int. Cl. E05b *27/08*
U.S. Cl. 70—363 **9 Claims**



A key-operated lock mechanism has a tumbler support carrying spring-loaded tumblers which may be moved in their keyway passages by the fingers of a key insertable through a keyhole so that depending pins on a pivotal detent are aligned therewith in an unlocked position. When in the locked position, the pins merely contact the upper surfaces of the tumblers. A guard depends from the detent between the keyhole and the keyway so that the key fingers lift the guard and upwardly pivot the detent upon movement of the key towards the keyway. The key has an aperture receiving the guard when the fingers align the tumbler holes with the detent pins to permit the detent to pivot downwardly into the unlocked position.

3,604,232
ELASTIC KEYRING
Sylvia J. Mosher, 6633 Berquist, Canoga Park, Calif.
Filed Nov. 21, 1968, Ser. No. 777,703
Int. Cl. A44b *15/00*
U.S. Cl. 70—457 **7 Claims**



A keyring having a body in the form of a wide, flat, continuous loop of cloth-covered elastic material which is circumferentially stretchable, with individual elastic key attachment loops on the outside of the body loop which are adapted to circumferentially stretch along with the body. The

keyring is generally soft and flexible for easy and comfortable carrying in purse or pocket, and is circumferentially stretchable for engagement over the hand and attachment about the wrist for convenient and comfortable carrying of the keyring while shopping, while carrying groceries or other packages, or while engaged in sporting activities.

3,604,233

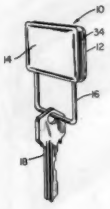
COMBINATION KEY AND COIN HOLDER

Lowell W. Barrett, 12731 W. Alameda Dr., Denver, Colo.

Filed Dec. 23, 1968, Ser. No. 786,066

Int. Cl. A44b *15/00*

U.S. Cl. 70—459 **8 Claims**



A combination coin and key holder comprised of a body having a key frame slidably attached thereto, the key frame movable to a bottom position in which keys can be inserted in the key frame, a top position in which a coin can be inserted in a hollow section in the bottom of the body, and a middle position in which the key frame is locked in a position where keys cannot be removed from the key frame, and the coin is locked inside the body.

3,604,234

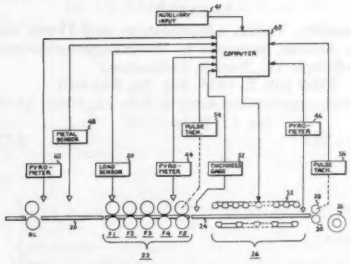
TEMPERATURE CONTROL SYSTEM FOR MILL RUNOUT TABLE

Eric N. Hinrichsen, Schenectady, N.Y., and Eugene R. Turk, Phoenix, Ariz., assignors to General Electric Company

Filed May 16, 1969, Ser. No. 825,280

Int. Cl. B21b *37/10*

U.S. Cl. 72—13 **11 Claims**



Individually controllable water sprays form a strip cooling zone at a runout table between the last stand of a hot strip finishing train and a coiler. The times required for successive sections of the strip to traverse the runout table (designated residence times) are calculated from a predetermined strip velocity-time profile. Using the residence times, the finishing train temperature, and the desired coiling temperature, spray patterns of varying lengths are calculated for successive sections. The spray patterns are changed to coincide with the movement of the sections across the runout table.

3,604,235

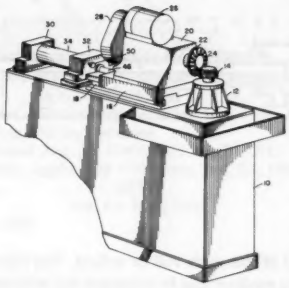
ROLLING OF TAPERED GEARS

Carl H. Motz, Harper Woods; David W. Daniel, Birmingham, and Raymond S. Kusz, Mount Clemens, all of, Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Oct. 30, 1969, Ser. No. 872,692

Int. Cl. B21d *53/28*

U.S. Cl. 72—84 **9 Claims**



A machine for finish-rolling rough-cut tapered gears such as hypoid gears, comprising means for meshing a tool or die in the form of a hypoid ring gear with a hypoid pinion in properly meshed relation, and establishing rolling pressure between the die and pinion by effecting advance of the die or pinion in a direction parallel to its axis.

3,604,236

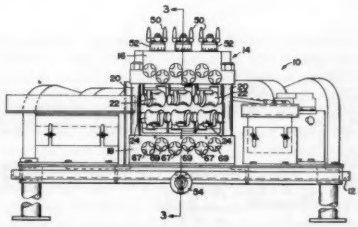
CROSS ROLL ADJUSTING AND LOCKING MEANS

William Hyams, Bethel Park, Pa., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed Aug. 30, 1968, Ser. No. 756,688

Int. Cl. B21b *19/02*; **B21d** *3/04*

U.S. Cl. 72—99 **2 Claims**



Cross roll carrier frames are rotatably supported in the roll frame housing. A pair of spaced manually operated screws engage each frame on either side of the centerline of the frame with one screw adjusting the frame in one direction and the other screw locking the frame in its adjusted position. The operation of the screws is reversed for adjustment in the other direction.

3,604,237

WORK ROLLS AND COOLING METHOD THEREOF

Takao Kawanami, No. 13, Azakitanoyama, Oaqanawa, Uenocho, Chita-gun; Toyokazu Saito, No. 39, 1-chome, Sakushita-cho Minami-ku, Nagoya-shi, and Hiro Mori, No. 7, Aza-higashiyamada, Oazafukijims, Uenocho, all of Aichi-ken, Japan

Filed Apr. 1, 1968, Ser. No. 717,611

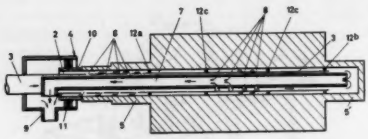
Claims priority, application Japan, Feb. 5, 1968, Apr. 3, 1967, Apr. 3, 1967, 43/7418;42/27669;42/21101

Int. Cl. B21b *27/06, 27/08*

U.S. Cl. 72—201 **5 Claims**

A method of cooling work rolls in a rolling mill is comprised of forming an axially extending passageway through

the work roll and disposing a cooling medium within the passageway for limiting the temperature differences along the surface of the work roll. The cooling medium can be a solid member having a higher rate of thermal conductivity than



the material of the work roll or a fluid. The flow path of the fluid cooling medium can be arranged for selectively contacting only certain portions of the roll member within the axially extending passageway.

3,604,238

APPARATUS FOR THE PRODUCTION OF STEEL PIPES BY EXTRUSION

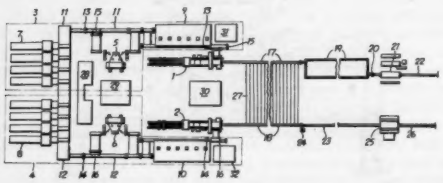
Akira Asari, Osaka, Japan, assignor to Kobe Steel Ltd.

Filed Apr. 1, 1969, Ser. No. 812,145

Claims priority, application Japan, Apr. 3, 1968, Aug. 24, 1968, 43/21932;43/60764

Int. Cl. B21b *15/00;* **B21c** *23/00*

U.S. Cl. 72—206 **2 Claims**



A steel pipe production apparatus has a pipe production portion and a steel pipe treatment portion. The pipe production portion has two or more systems of pipe production lines, one of which is an extruded pipe-producing apparatus and the other of which is an extruded pipe-producing apparatus or a rolled pipe-producing apparatus. The steel pipe treatment portion is downstream of said pipe production portion and has one system which is a hot rolling line and one or more systems which are hot lines. The hot rolling lines include a stretch reducer for reducing steel pipes supplied from the pipe production portion. The hot lines include means for after-treating steel pipes supplied from the pipe production portion. Transfer means are provided between said pipe production portion and said steel pipe treatment portion for enabling steel pipes from the pipe production line to be selectively delivered to any one of the hot rolling line or the hot lines.

3,604,239

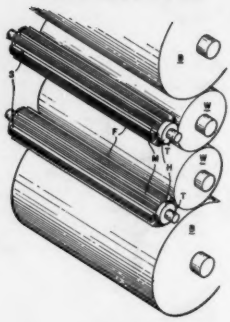
ROLLING MILL AND METHOD OF REMOVING COATING FROM A WORK ROLL OF THE MILL

Arthur L. Moxon, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of application Ser. No. 756,183, Aug. 29, 1968, now abandoned. This application Apr. 1, 1969, Ser. No. 813,807

Int. Cl. B21b *27/04, 27/06*

U.S. Cl. 72—236 **19 Claims**



A method of treating the working surface of a rolling mill roll on which roll coating accumulates during rolling of work in the mill comprising without removing the roll from the mill flailing the working surface of the roll with flexible elements so that portions of the elements adjacent the ends thereof engage such surface of the roll and by such flailing action rubbing abrasive particles over such surface of the roll and thereby removing at least part of the roll coating accumulated on the working surface of the roll. Further, a rolling mill comprising a roll for acting on work passing in contact therewith, which roll picks up matter from the surface of the work being acted on, and means for removing at least part of such matter from the roll, such means comprising flexible elements and means for mounting the flexible elements for flailing action so that portions of the elements adjacent the ends thereof engage the working surface of the roll, and abrasive particles rubbed over such surface of the roll by the flailing action of the flexible elements.

3,604,240

NECK-FORMING APPARATUS FOR CARTRIDGE SHELLS

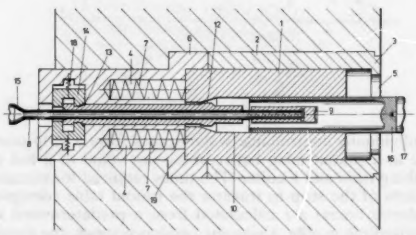
Rolf Weyhmuller, Vaduz, Liechtenstein, and Franz Xander, Gisingen, Austria, assignors to Werkzeugmaschinenfabrik-Oerlikon-Buhrle AG, Zurich, Switzerland

Filed July 8, 1969, Ser. No. 840,010

Claims priority, application Austria, July 12, 1968, A6781/68

Int. Cl. B21d *45/00*

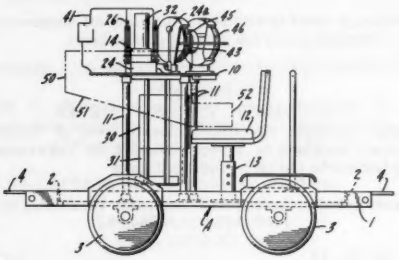
U.S. Cl. 72—345 **8 Claims**



A neck is formed on a cup-shaped cartridge shell blank in an axially movable tubular die whose cavity tapers at one

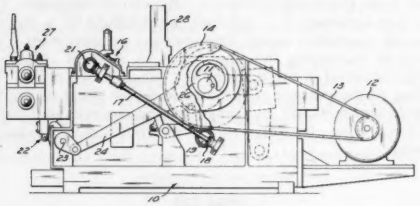
end. A tubular mandrel and an ejector pin slidable in the mandrel enter the cavity through the tapering end, and a driver moves axially into and out of the other end. A lost-motion coupling connects the driven ejector pin with the mandrel. A neck is formed on a blank while the blank is pushed by the driver over the stationary mandrel in the tapering die end. The driver moves with the ejector pin to discharge the finished cartridge shell.

3,604,241
RAILROAD SPIKE STRAIGHTENER
Weltzin B. Blix, Jr., South Milwaukee, Wis., assignor to Nordberg Manufacturing Company, Milwaukee, Wis.
Filed Feb. 6, 1969, Ser. No. 797,034
Int. Cl. B21d *37/10*; **B21j** *7/28*
U.S. Cl. 72—416 **2 Claims**



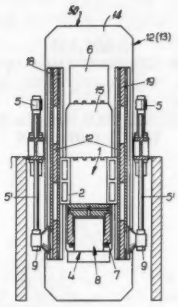
A spike straightener for straightening spikes used along railroad tracks. On any suitable carrier, for example, a railroad car, a spike-straightening unit is provided which is power driven but is controlled by the operator who has to use at least two handles to actuate it, thereby preventing unintended actuation against a hand of the operator. One power unit is effective to operate a cleaning device and another the straightening device.

3,604,242
TRANSFER AND EJECTION MECHANISM FOR FORGING MACHINE
Gene E. Allebach, and Richard Edmondson, both of Tiffin, Ohio, assignors to The National Machinery Company, Tiffin, Ohio
Filed Dec. 18, 1968, Ser. No. 784,806
Int. Cl. B21d *43/02, 45/00, 43/10*
U.S. Cl. 72—421 **26 Claims**



A transfer and ejection mechanism for a forging machine is disclosed. The transfer operates through a closed path including a first portion of arcuate movement in a direction substantially perpendicular to the die face, a second portion of transfer movement in a substantially straight line to a position adjacent to a subsequent die, and a third portion of arcuate movement inwardly toward the die face and substantially perpendicular thereto. The in and out movement eliminates the need for a precise adjustment of the knockout and rearward positioning of subsequent dies with respect to the preceding dies. The final movement back to the initial position is along a curved path wherein the transfer fingers are raised clear of the tool and return movement is commenced before the tool withdraws from the die. This substantially reduces the dwell required at the delivery position. The ejection mechanism causes rapid ejection to a blank-gripping position, slower ejection during gripping, and subsequent fast ejection to complete the blank ejection. This is particularly important when transferring blanks with short shanks since it provides sufficient time to grip a blank without increasing ejection time.

3,604,243
FRAME STRUCTURE AND GUIDE CONSTRUCTION OF AN HYDRAULIC PRESS
Ernst Muller, Konizsberger Stras Be 18 5458 Bad, Niederbreisig, Rhein, Germany
Filed Jan. 23, 1969, Ser. No. 793,513
Claims priority, application Germany, Jan. 23, 1968, P 16 52 808.8
Int. Cl. B21j *9/02*
U.S. Cl. 72—455 **8 Claims**

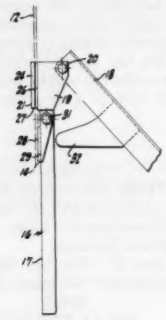


A high capacity press includes a fixed foundation and a frame which is movable in respect to the foundation by a fluid pressure operated drive comprising a cylinder and plunger movable in the cylinder. Each frame is made up of a plurality of plates arranged in a stack, the plates being either of a closed frame forming configuration or made up of two oppositely arranged C-shaped plates oriented with their legs abutting to form a closed frame. A guide system for the frames is carried on the foundation and engaged with the frame or guiding the frame during its movement and includes an upper guide of substantially T-shaped configuration which extends transversely between adjacent frame elements and bears against the frame in at least two planes and a lower guide comprising elements which extend radially outwardly from the drive cylinder and engage the frame in at least two separate radial planes.

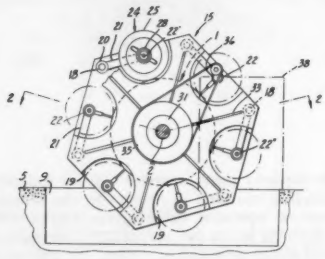
3,604,244
STRAP-BENDING TOOL
William A. Thomas, 1585 152nd Ave., San Leandro, Calif.
Filed July 7, 1969, Ser. No. 839,171
Int. Cl. B21j *13/08*
U.S. Cl. 72—459 **9 Claims**

A tool for bending metal straps such as those used to support service pipes and conduits intermediate a floor structure and ceiling suspended therebelow of the type separating successive floors in modern multiple-story commercial buildings. The strap-bending tool includes a pair of handles supported for relative pivotal movement between open and closed positions. One such handle is equipped with a strap holder adapted to have a strap inserted thereinto so as to extend downwardly along the holder-equipped handle. Pivotally supported by such one handle below the holder thereon is a strap-bending element which underlies the free end portion of any strap inserted into the holder. A force applicator car-

ried by the other handle is engageable with the strap-bending element to displace the same angularly when the handles are closed and thereby bend the free end portion of such strap about the anvil defined the lower edge of the strap holder.



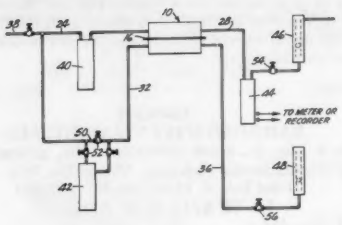
3,604,245
TIRE TESTING APPARATUS
Edmond J. Atelian, San Carlos, Calif., assignor to Western Gear Corporation
Filed Dec. 22, 1969, Ser. No. 886,937
Int. Cl. G01n *3/56*
U.S. Cl. 73—8 **7 Claims**



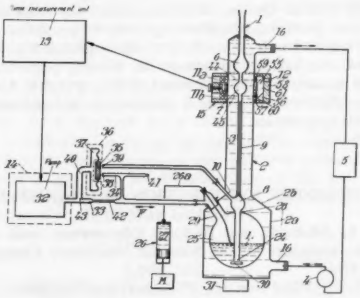
Tire testing apparatus which includes a relatively large rotating rod drum provided with a plurality of wheel mounts substantially equally spaced around the entire periphery of the road drum and each adapted to rotatably support a wheel on which a tire to be tested is mounted. Means is provided for indexing the mounts about the road drum in order to permit the convenient mounting and removal of wheels with respect to each wheel mount. The apparatus insures that the loading on all tires undergoing tests is equal.

3,604,246
PERMEABILITY TESTING APPARATUS AND METHOD
Paul E. Toren, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sept. 14, 1965, Ser. No. 487,256
Int. Cl. G01m *3/16*
U.S. Cl. 73—38 **16 Claims**

Apparatus for measuring the permeability of films by monitoring flowing gas streams contacting surfaces of the film, including a gastight cell consisting of a pair of cuplike sections adapted to clamp a sheet of film material tightly between them to hold it in gastight relationship to both of the sections, to form two compartments separated by the said film, means being provided so that a test gas flows through one of the compartments and sweep gas flows through the other compartment, the sweep gas being conveyed to a detector to determine the amount of test gas which is present because of having passed through the film. Bypass means is provided so that sweep gas can be passed through both chambers in order to establish a base line for improved accuracy in detecting very low rates of permeability.



3,604,247
AUTOMATIC VISCOSITY METER
Philippe Gramain, and Roger Libeyre, both of Strasbourg, France, assignors to Agence Nationale De Valorisation De La Recherche (Anvar), Puteaux, France
Filed July 18, 1969, Ser. No. 843,116
Claims priority, application France, July 19, 1968, Feb. 26, 1969, 159,951;6,904,967
Int. Cl. G01n *11/06*
U.S. Cl. 73—55 **6 Claims**

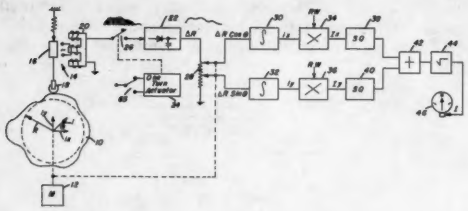


The automatic viscosity meter comprises a vertical tube in which flows the liquid whose viscosity is to be measured. This tube is maintained at a constant temperature by a thermostatically controlled liquid. The viscosity measurement is obtained by measuring the time taken by a given volume of liquid contained in the tube to flow between two points. The reading of the passage of the meniscus past these two points is made automatically by using luminous sources and only a single-receiving element, with the interposition of a prism or mirrors.

3,604,248
APPARATUS AND METHODS FOR DETERMINING IMBALANCE
Heinz C. Altmann; Clifford B. Bushnell; Henry L. West, and Thomas O. Lange, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 25, 1969, Ser. No. 852,719
Int. Cl. G01m *1/00, 1/14*
U.S. Cl. 73—66 **9 Claims**

Radial variations about the periphery of an element are the basis for determining the imbalance of such member. Such variations are resolved into vector components; and integrated over a single traversal of such periphery. The

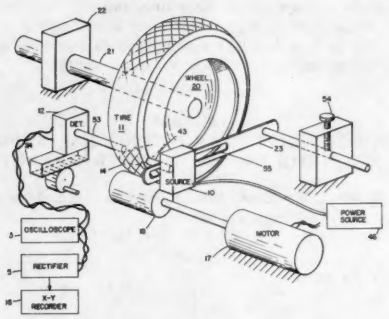
technique is used to determine web roll imbalance; and dimensional growth of the roll is accommodated by use of a positional pickoff. Positioning of the pickoff is used to weight the effect of the vector components.



3,604,249
METHOD AND APPARATUS FOR TESTING PNEUMATIC TIRE CASINGS

David G. Wilson, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed June 21, 1968, Ser. No. 738,926
Int. Cl. G01h *13/00*
U.S. Cl. 73—67.2 **9 Claims**



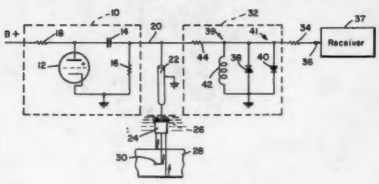
Apparatus and method for testing pneumatic tire casings while the inflated tire is mounted on a wheel is described. A vibration source in contact with the exterior surface of the tire is caused to vibrate at the natural resonance frequency of the mounted tire. A detector sensitive to the vibration of the tire is in contact with a different region of the exterior surface of the tire. Typically, the vibrator is located on the sidewall of the tire opposite that on which the detector is located and displaced from each other in the circumferential direction. The vibrator and detector positions are maintained constant with respect to one another while they are both moved relative to the tire circumference thereby checking the vibration transmission characteristic of the entire tire. A defect in the tire cord or ply separation of the cord is evidenced by a substantial change in the detected vibration.

3,604,250
COUPLING NETWORK FOR AN ULTRASONIC TESTING SYSTEM

Willem A. Grandia, Charlotte Harbor, Fla., assignor to Air Products and Chemicals, Inc. and North American Rockwell Corporation, part interest to each

Continuation of application Ser. No. 598,018, Nov. 30, 1966, now abandoned. This application Oct. 20, 1969, Ser. No. 867,853
Int. Cl. G01n *24/00*
U.S. Cl. 73—67.5 **4 Claims**

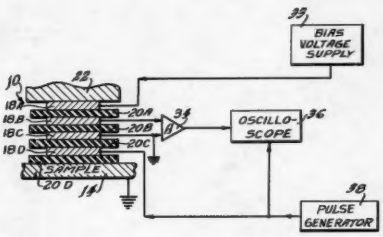
This disclosure relates to an ultrasonic-testing system, and includes circuitry for damping low frequency oscillations in an ultrasonic transmitted pulse signal. A low frequency filter is connected across a limiting circuit to dampen low frequency signals to permit reflected signals from short distances to be detected.



3,604,251
CAPACITIVE ULTRASONIC DEVICE FOR NONDESTRUCTIVELY TESTING A SAMPLE

Norman E. Dixon, Pasco, Wash., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Apr. 18, 1969, Ser. No. 817,505
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.7 **11 Claims**



In an apparatus for ultrasonically testing a sample, a plurality of electrodes and dielectric members are mounted in alternate layered arrangement in pressure engagement with the sample. The electrodes adjacent the sample are maintained at a reference potential and means apply a bias voltage relative said reference potential to the electrode furthermost of said sample. A plurality of amplifiers combine the output voltages relative said reference potential of the others of said electrodes to provide a measure of ultrasound in the sample.

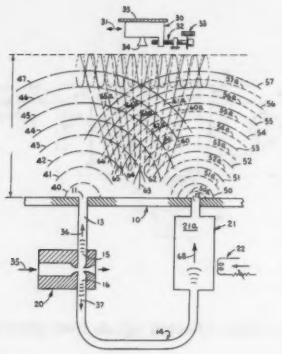
3,604,252
INTERFEROMETRIC SYSTEM FOR MEASURING PHYSICAL CONDITION OF A MEDIUM

Basil B. Beeken, New Haven, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 16, 1970, Ser. No. 11,734
Int. Cl. G01n *9/24*
U.S. Cl. 73—69 **4 Claims**

An acoustical interferometric system that includes two effective sources of ultrasonic radiation for establishing a normal pattern of interference fringes, the radiation from one of said sources passing through a fluid medium that is subject to physical changes, such as temperature and/or density changes, whereby such changes can be effectively sensed by detecting means that are sensitive to shifts in the pattern of

interference fringes; such shift being caused by variations in the speed at which the acoustical radiation is conducted



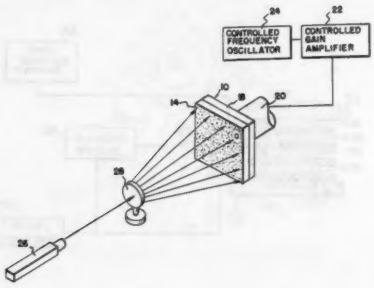
through said medium, the speed variations resulting from the said physical changes.

3,604,253

METHOD OF VIBRATION ANALYSIS EMPLOYING COHERENT LIGHT

Leonard A. Kersch, and James Seydel, both of Ann Arbor, Mich., assignors to GCOptronics, Inc., Ann Arbor, Mich.

Filed Aug. 8, 1968, Ser. No. 751,089
Int. Cl. G01h *9/00*
U.S. Cl. 73—67.2 **7 Claims**



To detect physical anomalies in a member such as cracks or subsurface defects, a surface of the member is illuminated with light derived from a laser and vibration is induced in the member. The member will appear to have a speckled or mottled appearance in areas which are not in motion because of the interference at the eye between light reflected from various points on the member. When the member is in motion the speckled pattern disappears and the object appears as if normally illuminated. By varying the frequency and intensity of vibratory motion imparted to the member local regions of the member which contain a defect or flaw are caused to vibrate independently of the balance of the member and these flaws are detected by observing modifications in the mottled pattern.

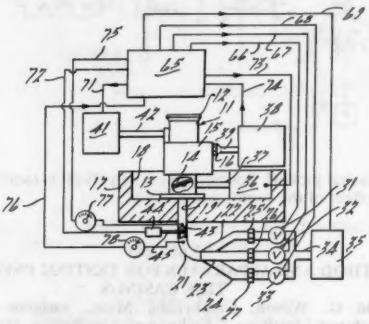
3,604,254

TEST METHOD AND APPARATUS FOR CHARGE FORMING DEVICES

Joseph Sabuda, 14032 Hubbard, Livonia, Mich.

Filed Sept. 17, 1969, Ser. No. 4,788
Int. Cl. G01m *19/00*
U.S. Cl. 73—118 **7 Claims**

A method and apparatus for accurately calibrating and adjusting charge forming devices for internal combustion engines under conditions accurately simulating actual operating conditions. The charge forming device induction passage is placed in a fluid circuit that includes a sonic nozzle with a throttle valve being interposed between the charge forming device induction passage and the sonic nozzle. The sonic nozzle has the characteristic that at pressure differentials greater than a predetermined critical pressure differential the flow velocity through the throat is maintained at the sonic



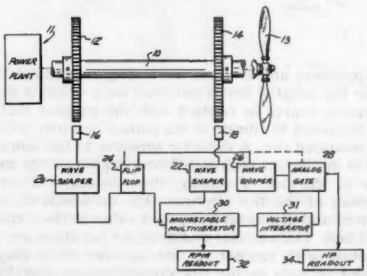
velocity. A pressure differential is established across the sonic nozzle, which pressure differential is greater than this critical pressure and by interrelating the operation of the throttle valve of the charge-forming device and the throttle valve of the test apparatus, the critical pressure ratio is maintained while various engine-operating conditions are simulated. The air and fuel flow through the carburetor can then be accurately measured at these varying conditions.

3,604,255

POWER METER FOR ROTATING SHAFTS AND METHOD OF PROVIDING POWER READOUT THEREFOR

Hans U. Bart, Whitehall, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Feb. 20, 1970, Ser. No. 13,125
Int. Cl. G01l *3/10*
U.S. Cl. 73—136 A **13 Claims**



A pair of proximity pickups located adjacent a pair of axially spaced gears on a rotating shaft generate alternating current waves in response to movement of the gear teeth, the waves being converted to rectangular waves through wave shapers and transmitted to a flip-flop to yield a rectangular wave the width of which is the lag of one of the input waves behind the other due to torque on the shaft so that the width of the wave is proportional to torque. One of the signals from the flip-flop is directed to a monostable multivibrator the output of which provides an r.p.m. readout for the shaft. The rectangular waves representing torque are transmitted to an analog gate which is opened by the leading vertical edges of tee input waves thereto, the energy entering said analog gate when opened being derived from a voltage integrator which

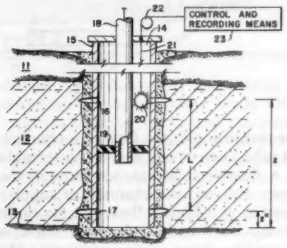
converts voltage pulses from the monostable multivibrator into an integrated voltage value proportional to the rotational speed of the shaft. The result is that the analog gate produces a final, substantially rectangular wave having a width proportional to torque and an amplitude proportional to the rotational speed of the shaft so that the area beneath the wave is proportional to the horsepower delivered by the shaft.

3,604,256

METHOD FOR MEASURING THE AVERAGE VERTICAL PERMEABILITY OF A SUBTERRANEAN EARTH FORMATION

Michael Prats, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Jan. 31, 1969, Ser. No. 795,408
Int. Cl. E21b *47/10*
U.S. Cl. 73—155 **7 Claims**



A method for measuring the average vertical permeability of a subterranean earth formation by extending a well borehole into the earth formation and sealing off the well borehole at least adjacent to the portion of the formation desired to be measured. The sealed-off portion of the well borehole is perforated at least at two vertically spaced points in the well borehole and the well borehole is sealed off between the perforations. Fluid is then flowed at a substantially constant rate through one of the perforations at one of the points while the pressure response in the well borehole is measured at the perforations of the other of the points without flowing fluid through the latter perforation.

3,604,257

METHOD OF TESTING AND SELECTING GLASS CLOTH FOR USE IN POLYIMIDE COMPOSITES

Irving Serlin, 94 Hadley St., Springfield, Mass.

Filed Jan. 31, 1969, Ser. No. 795,734
Int. Cl. G01h *33/36*
U.S. Cl. 73—159 **12 Claims**

A method for the testing and selecting of glass cloth suitable for use in the preparation of polyimide resin impregnated composites. The method comprises determining the extractable polyol content of the glass cloth and then selecting glass cloth having an extractable polyol content of from 0.60 to 0.90 percent by weight based on the weight of the glass cloth for use in the preparation of the polyimide resin impregnated composite.

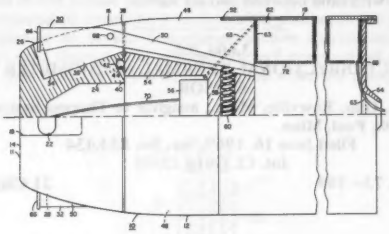
3,604,258

UNIFORM DESCENT-RATE PROBE

Karl Maiershofer, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 21, 1969, Ser. No. 868,063
Int. Cl. G01d *1/00*
U.S. Cl. 73—170 A **9 Claims**

As a probe descends into the water under the influence of gravity, a wire is paid out to carry to a signal indicator information concerning the properties of the water, such as the temperature thereof, at various depths of the water. Means are provided to keep the rate of descent of the probe constant even though the paying out of the wire lessens the weight of the probe. These means may take the form of variably positionable spoiler vanes that add less and less amounts of resistance of the water to the descent of the probe therethrough as the probe becomes lighter, or means



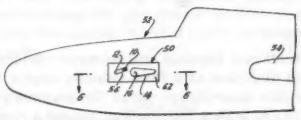
to cause more water to flow through the probe as the weight of the probe becomes less.

3,604,259

ANGLE OF ATTACK MEASURING DEVICE WITH ADJUSTABLE AIRFOIL

Allan B. Heinsohn, Valley Cottage, and Donald M. Neary, Pearl River, both of, N.Y., assignors to Rosemount Engineering Company, St. Eden, Prairie, Minn.

Filed May 2, 1969, Ser. No. 826,772
Int. Cl. G01c *21/00*
U.S. Cl. 73—180 **25 Claims**



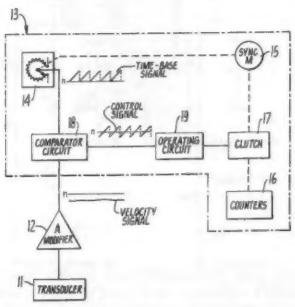
An angle of attack measuring device is mounted on an aircraft in the airflow-deflection path of an airfoil. The airfoil is operatively secured to the aircraft at a location spaced from the wing. The relative angular position of the airfoil is controllably variable to adapt the operation of the angle of attack measuring system to different flight conditions of the aircraft.

3,604,260

LOGGING APPARATUS FOR VESSELS

Robert D. Ogg, Portland, Maine, assignor to The Eastern Company

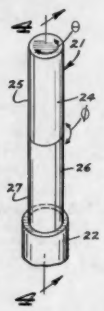
Filed Dec. 24, 1969, Ser. No. 887,995
Int. Cl. G01c *21/00*
U.S. Cl. 73—181 **10 Claims**



Apparatus for indicating the distance travelled by a vessel comprising a counter that operates cyclically and for periods of time during each cycle which is a linear function of the velocity of the vessel. The counter is operated with a control circuit which is energized in response to an electrical output

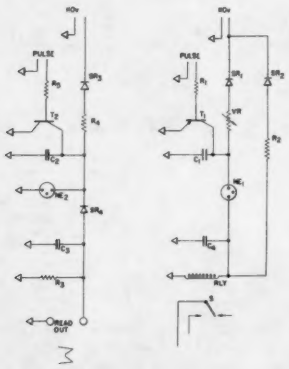
signal that is substantially proportional and linear to the velocity of a vessel and a second electrical signal that varies linearly with time between two set values.

3,604,261
MULTIDIRECTIONAL THERMAL ANEMOMETER SENSOR
John G. Olin, Roseville, Minn., assignor to Thermo Systems, Inc., St. Paul, Minn.
Filed June 16, 1969, Ser. No. 833,434
Int. Cl. G01p *13/00*
U.S. Cl. 73—189 **21 Claims**



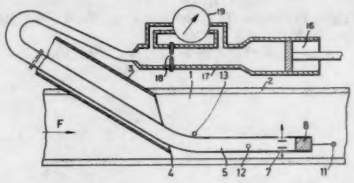
A multidirectional thermal anemometer device to sense the speed and direction of a fluid velocity vector by making qualitative and/or quantitative use of the asymmetry or nonuniformity of the heat flux distribution around a constant-temperature thermal anemometer sensor. The sensor has segmented heat sensing films covering the entire surface of the sensing body. The entire surface of the sensing body is heated with one or more constant-temperature anemometer electronic control systems electrically coupled to each segment of the film. The electrical outputs of the control systems are operated on by either a digital or analog computer to yield quantitative information about the magnitude and direction of the fluid velocity vector.

3,604,262
FLOW RATE AND LOW FLOW INDICATOR
Mike Craddock, P.O. Box 1068, Big Spring, Tex.
Filed Dec. 10, 1968, Ser. No. 783,467
Int. Cl. G01f *1/04*; **G08b** *21/00*
U.S. Cl. 73—194 R **2 Claims**



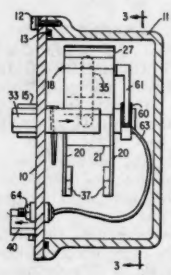
A flow measuring and monitoring system is provided that both measures flow and provides an indication when the flow falls below a predetermined minimum flow rate.

3,604,263
DEVICE FOR MEASURING THE FLOW INTENSITY OF CIRCULATING LIQUID
Michel Joseph Auphan, Neuilly, and Jean Perilhou, Bourg La Reine, both of, France, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 28, 1969, Ser. No. 794,495
Claims priority, application France, Jan. 31, 1968, 138125
Int. Cl. G01p *5/10*
U.S. Cl. 73—204 **9 Claims**



A device for measuring liquid flow in a channel includes a first elongated tube open at one end and insertable through a channel wall. A flexible tube extends through the first tube and out the open end into the channel for supplying an auxiliary liquid thereto at a known flow rate via outlet openings provided near the front end of the tube. First, second and third thermosensitive elements for measuring the temperatures of the channel liquid, the auxiliary liquid and the mixed liquids, respectively, are disposed outside of the flexible tube, within the flexible tube, and near the front end of the flexible tube within the channel, respectively.

3,604,264
FLOW METER
Leon J. Nowak, Oxford Towne Apartments, Gateshead Rd., New Hartford, N.Y.
Filed Dec. 23, 1969, Ser. No. 887,530
Int. Cl. G01f *1/06*
U.S. Cl. 73—228 **3 Claims**



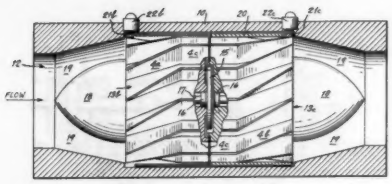
A container is mounted in an enclosure for movement along a fixed path. The enclosure has an outlet connected to a suction line, such as a pump, and an inlet is arranged to discharge liquid into the container. The container is moved along the path by the weight of the liquid accumulating in the container. The container is provided with discharge means which functions automatically to increase the volume of liquid discharged from the container, the arrangement being such that the discharge is equal to the flow of liquid into the container, whereby the container is moved to a position proportional to the volume of the flow of liquid into and out of the container. Position indicating means is actuated by the container to indicate the position thereof at all times, thus indicating the flow of liquid through the meter. The container discharge means is adjustable exteriorly of the enclosure to accurately indicate the flow of liquids of different densities.

3,604,265

FLUID-DRIVEN MASS FLOWMETER

Mason P. Wilson, Jr., Kingston, R.I.; Joseph B. Gordon, Northford, and John B. Duffy, Branford, Conn., assignors to Neptune Meter Company, New York, N.Y.

Filed Mar. 19, 1969, Ser. No. 808,432
Int. Cl. G01f 1/00
U.S. Cl. 73—231 M 12 Claims



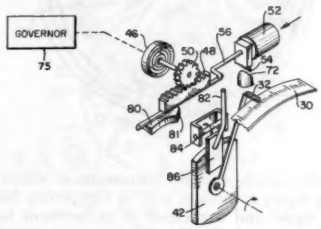
A fluid-driven mass flowmeter comprising two identical impellers or rotors, having the same blade pitch design, arranged in tandem, back to back, and coupled by an intermediate linear torsion spring such that the upstream rotor is driven as a compressor by the downstream rotor which acts as a turbine. Energy input and flow turbulence are minimized and increased torque on the rotors is derived by the use of a compound blade shape and close rotor positioning so that the annular momentum which the upstream or compressor rotor puts into the passing stream, in the form of a swirl, is removed by the downstream or turbine rotor. The differing torques acting on the two rotors cause an angular displacement between them and an indication of the mass flow is obtained by measuring the time displacement of suitable markers on each rotor, which markers are axially aligned at zero angular displacement.

3,604,266

TEMPERATURE MEASURING APPARATUS

George E. Chilton, Haworth, N.J., assignor to Computer Diode Corporation, Fair Lawn, N.J.

Filed June 5, 1969, Ser. No. 830,648
Int. Cl. G01k 7/20, 3/00; G01d 1/00
U.S. Cl. 73—362 R 18 Claims



A temperature-measuring system comprising a disposable heat receptor that is adapted to be placed in heat-absorbing relationship with a body or atmosphere whose temperature is to be measured and apparatus for receiving the heat receptor and for measuring its temperature, the temperature measuring apparatus including means for automatically locking the temperature indicator after a predetermined time delay.

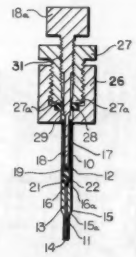
3,604,267

SAMPLE INJECTION APPARATUS

Theron Johns, Orange, Calif., assignor to Beckman Instruments Inc.

Filed Jan. 15, 1969, Ser. No. 791,265
Int. Cl. G01n 1/00
U.S. Cl. 73—422 GC 8 Claims

Syringe-type apparatus for injecting a fluid sample into a fluid stream including a plunger section and a needle section enclosing a sample cavity of predetermined volume and diameter. The cavity includes a discharge opening in the front of the needle section and a gas inlet opening adapted to be opened or closed by a reciprocable plunger in the plunger section of the device. The plunger section also includes a gas inlet port through the sidewall thereof communicating with the inlet opening to the needle section when the plunger is in



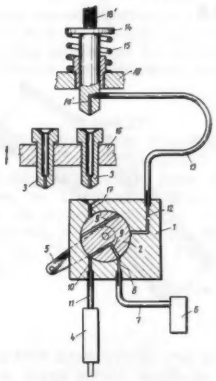
a retracted position. The needle section has a shoulder formed on the outer surface thereof at a position between the discharge opening and the inlet opening to the cavity. The shoulder is constructed to engage an abutment within a sample port thereby obstructing flow of the gas stream through the port and causing the gas stream to flow through the gas inlet port into the sample injector cavity to sweep the sample from the cavity.

3,604,268

METHOD AND DEVICE FOR INTRODUCING SAMPLES INTO CHROMATOGRAPHIC COLUMNS

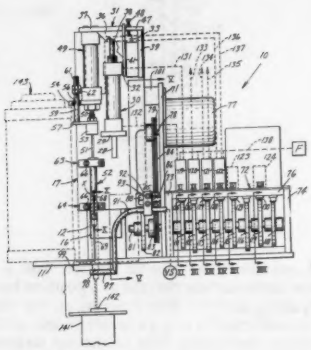
Jiri Hrdina, Prague, Czechoslovakia, assignor to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

Filed Apr. 8, 1969, Ser. No. 814,290
Claims priority, application Czechoslovakia, Apr. 9, 1968, 2628-68
Int. Cl. G01n 1/00
U.S. Cl. 73—422 GE 5 Claims



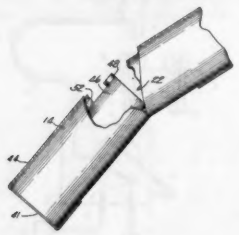
A method and device for introducing into a chromatographic column a sample held in a cartridge. The cartridge is placed on a carrier which is then placed between a valve casing and a superimposed spring-loaded pressure head. The valve in the casing is adjusted to pass eluate from a pump directly into the chromatographic column thereby bypassing the cartridge. The cartridge is then tightly clamped between the pressure head and the valve which is adjusted to pass eluate from the pump through the pressure head and through the cartridge into a chromatographic column.

3,604,269
AUTOMATIC GAS CHROMATOGRAPHIC SAMPLE INJECTION DEVICE
Edwin W. Smith, Climax Township, Kalamazoo County, and Ernest J. Kubiak, Jr., Kalamazoo, both of, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.
Filed June 20, 1969, Ser. No. 835,081
Int. Cl. G01n *1/02*
U.S. Cl. 73—422 GC 11 Claims



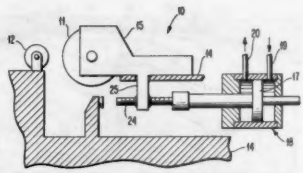
An apparatus for periodically injecting samples of fluid into a receptacle. The apparatus includes a movable frame which supports a syringe having a passageway adapted to be moved through an opening in the receptacle. The syringe controls the collection of a predetermined fluid sample and it is flushed after each use. The syringe is moved by the apparatus to inject the predetermined sample through the passageway into the receptacle.

3,604,270
SAMPLING LANCE WITH METAL TUBE
Richard A. Falk, 519 Westminster Dr., Waukesha, Wis.
Filed Jan. 5, 1970, Ser. No. 636
Int. Cl. G01n *1/12*
U.S. Cl. 73—425.4 R 8 Claims



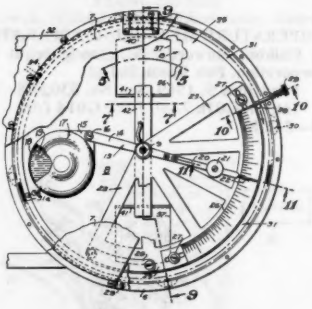
A sampling lance for a molten metal bath includes an elongated metal tube or sleeve having upper and lower sleeve portions which are partially separated by a notch and interconnected by a narrow web portion which bends under pressure or impact. The notch may be formed by two intersecting cuts in the sleeve. The notch is in registry with the side entry port of a refractory sample cartridge located within the metal sleeve. The metal sleeve protects the refractory cartridge while in the bath and also serves as a carrier for the cartridge. Upon removal of the lance from the metal bath, access to the cartridge is gained by striking the lower sleeve portion against the floor or a bench to shatter the cartridge and bend the web to open the notch. The refractory cartridge and sample can then be removed through the notch.

3,604,271
SENSING DEVICE FOR DETERMINING THE UNBALANCE OF A GRINDING WHEEL
Charles B. Matson, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc.
Filed Sept. 11, 1968, Ser. No. 759,171
Int. Cl. G01m *1/28*
U.S. Cl. 73—458 8 Claims



Means, which moves a grinding wheel into and out of engagement with a workpiece, has sensing means mounted thereon for movement therewith. The sensing means senses the magnitude of the force exerted on the moving means whereby the sensing means produces a signal that is indicative of the magnitude of unbalance of the grinding wheel.

3,604,272
SOFT WALL HYDROMETER
Homer S. Youngs, 8718 Dunaway Dr., La Jolla, Calif.
Continuation-in-part of application Ser. No. 583,244, Nov. 30, 1966, now abandoned. This application Oct. 22, 1969, Ser. No. 868,564
Int. Cl. G01n *9/08, 9/12*
U.S. Cl. 73—449 5 Claims

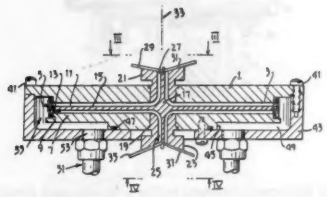


A specific gravity-sensing instrument in which a closed cell having highly compliant walls is completely filled with a reference liquid and immersed in an ambient liquid, and compensation is made for the difference in compression and thermal expansion of the material comprising the cell walls with either the reference liquid or ambient liquid so that when the cell is immersed, it responds equally to changes in density of the reference liquid and ambient liquid, thereby cancelling the effects of pressure and temperature and so as to measure directly the changes in specific gravity.

3,604,273
ANGULAR RATE SENSOR
Clyde Chi Kai Kwok, Montreal, Quebec; Zigmas Juozas Lapinas, Chomedy, Quebec, and Theo Guenter Heilmann, St. Laurent, Quebec, all of, Canada, assignors to Aviation Electric Limited, Montreal PQ, Canada
Filed Nov. 25, 1968, Ser. No. 778,727
Int. Cl. G01p *15/02*
U.S. Cl. 73—505 12 Claims

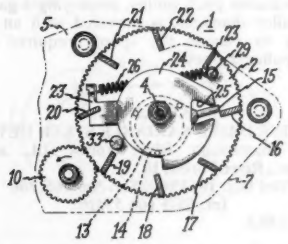
This application discloses an angular rate sensor. The sensor comprises a cylindrical chamber adapted to take part in

the angular movement to be sensed, fluid discharge means in the peripheral wall of the chamber by which fluid is in use discharged into the chamber with a component of velocity relative to the chamber wall and in a direction tangential to the chamber wall which is determined by the velocity of rotation of the cylindrical chamber about the axis of that chamber, an axial outlet from the chamber for the throughflow of fluid entering the chamber through the



peripheral wall, and port means associated with the axial outlet and exposed to the fluid flow through that outlet in such a manner that the pressure developed in the port means is indicative of the direction and the magnitude of the tangential component of the velocity of the fluid passing into the axial outlet, the effective axial outlet from the chamber being annular in form and defined by an outer wall and by an inner boundary which extends axially through the chamber.

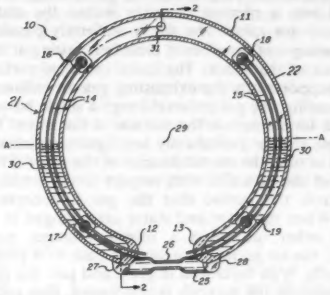
3,604,274
UNIFORM-TORQUE ESCAPEMENT MECHANISM
Ansell W. Palmer, Hampton, N.H., and Albert J. Leslie, York, Maine, assignors to General Electric Company
Filed Nov. 10, 1969, Ser. No. 875,245
Int. Cl. F16h *27/04*
U.S. Cl. 74—1.5 **14 Claims**



A escapement mechanism for converting continuous rotary motion to a snap-action motion is provided with a drive spring which is placed in tension by rotation of a lever arm that has its effective torque transmitting length shortened as the spring tension increases so that the torque on the input drive means is maintained relatively uniform.

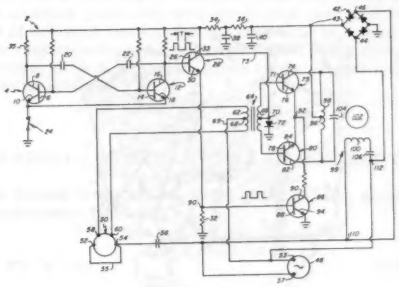
3,604,275
TOROIDAL ELECTROLYTIC SENSOR
Terrence S. Fox, and Glen W. Driskill, both of Phoenix, Ariz., assignors to Sperry Rand Corporation
Filed Oct. 23, 1968, Ser. No. 769,951
Int. Cl. G01c *19/46, 9/06*
U.S. Cl. 74—5.4 **9 Claims**

A toroidal electrolytic sensor having substantially symmetrical diametrically opposed electrodes for providing an elec-



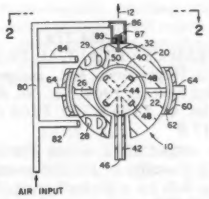
trical signal in accordance with the relative immersion of the electrodes with respect to each other.

3,604,276
PULSE TORQUER FOR VERTICAL GYRO
Charles Eliot Hurlburt, River Edge, and Frederic O'Neil, Parsippany, both of, N.J., assignors to The Bendix Corporation
Filed June 19, 1969, Ser. No. 834,721
Int. Cl. G01c *19/48*
U.S. Cl. 74—5.47 **9 Claims**



A pulse torquing erection system for a vertical gyro for improving gyro erection switch life by limiting the current through the erection switch and for improving flight conditions by more effective utilization of erection rates.

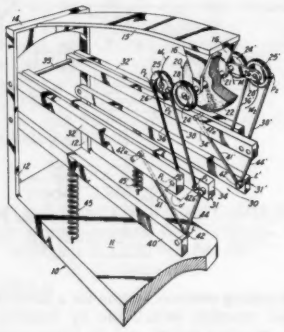
3,604,277
SINGLE JET PNEUMATIC PULSE DURATION MODULATION GYRO
William W. Stripling, and David L. Jones, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army
Filed Feb. 17, 1970, Ser. No. 11,990
Int. Cl. G01c *19/26, 19/28*
U.S. Cl. 74—5.12 **4 Claims**



A two axis all pneumatic displacement gyroscope that detects a change of position in pitch and jaw of a missile. The spin axis of the gyro rotor is directed along the longitudinal axis of the missile. The rotor utilizes a hydrostatic air bearing

and the gyro pickoff responds to the exhaust from the air bearing. A single air jet provides the rotor exhaust for the pickoff collectors. To provide the air bearing, a gas is introduced into a plenum chamber within the stator about which the rotor spins. The gas is uniformly passed through output passages of the plenum chamber, exiting at the spherical surface of the stator. The inner spherical surface of the rotor is supported by the exhausting gas. In exhausting from the air bearing, the gas passes through a single passage in the rotor that terminates on the surface of the rotor. The single output gas stream periodically impinges on pickoff devices arranged around the circumference of the rotor. The relative position of the pickoffs, with respect to the rotating output jet, controls the period that the gas is accepted by the pickoff. When the rotor and stator are changed in reference to each other, as when a missile changes position or direction, the air jet makes a varying path as it passes across the pickoffs. With variations in pitch and jaw, the period that gas impinges on the pickoffs is also varied, thus providing an output signal in response to the direction of change in trajectory.

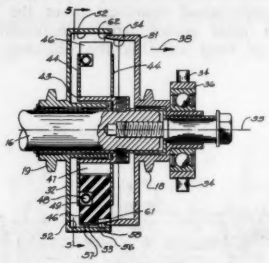
3,604,278
ROTARY MOTION DEVICE
Wriston W. Hartsell, P. O. Box 308, Mary Esther, Fla.
Filed Aug. 27, 1969, Ser. No. 853,347
Int. Cl. F16h *37/12, 21/18*
U.S. Cl. 74—52 **6 Claims**



A rotary motion device including a rotatably mounted shaft having a flywheel and two driven sun spur gears mounted thereon. Two driving planetary spur gears are mounted for rotation about the shaft while each is in mesh with one of the driven sun gears. Each of the driving planetary gears is rotated by a pair of driving arms connected to the planetary spur gear by a pair of driving rods and the relative position of each pair of driving arms is maintained by a spring urged positioning linkage.

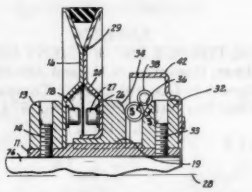
3,604,279
TWO-SPEED CENTRIFUGAL TRANSMISSION
Marion H. Davis, Hagerstown, Ind., assignor to Ferralog, Inc.
Filed Sept. 2, 1969, Ser. No. 854,463
Int. Cl. F16h *9/100;* **F16d** *23/10*
U.S. Cl. 74—217 B **16 Claims**

An engine output shaft drives the input member of a clutch having a plurality of friction members normally confined around a hub by a garter spring. The clutch has two output drums, each having a sprocket thereon coupled by a chain to a sprocket on a jackshaft which is, in turn coupled through sprockets and a chain to a vehicle drive wheel. The drums have internal surfaces engageable by the friction members due to centrifugal force as the engine speed increases. The drums are of different internal diameter for sequential engagement, and the jackshaft sprockets associated therewith



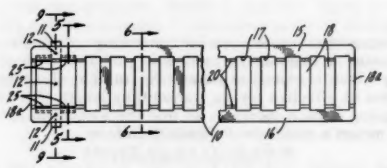
are also of different diameters for a low-speed drive first, and then a high-speed drive.

3,604,280
SPRING-CONTROLLED SHIFT SPEED ON DRIVEN VARIABLE PITCH PULLEY
Marion H. Davis, Hagerstown, Ind., assignor to Ferraloy, Inc., Salem, Ind.
Filed Mar. 27, 1970, Ser. No. 23,360
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 **12 Claims**



A driven variable pitch pulley, employing a garter spring to change pulley diameter, is provided with an additional garter spring to elevate the speeds required to obtain decreases in pulley diameter.

3,604,281
POSITIVE DRIVE VARIABLE SPEED DEVICE
Howard G. Shambaugh, River Forest, Ill., assignor to Lovejoy, Inc., River Forest, Ill.
Filed Oct. 10, 1969, Ser. No. 865,260
Int. Cl. F16h *55/36*
U.S. Cl. 74—230.5 **15 Claims**



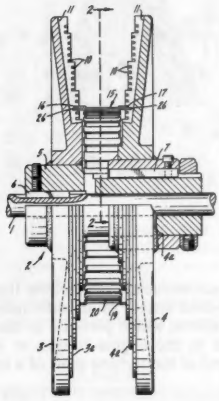
A positive drive, variable speed device in which a belt support is formed of an elongated strip, the strip being coilable to vary its diameter and having longitudinal edge portions and a central slotted portion bendable to match the pitch diameter and pitch dimension of a continuous, toothed drivebelt and a pulley mounting for the belt support.

3,604,282

POSITIVE DRIVE, VARIABLE SPEED STRUCTURE

Howard G. Shambaugh, River Forest, and Henry W. Faulstich, Chicago, both of, Ill., assignors to Lovejoy, Inc., River Forest, Ill.

Filed Oct. 10, 1969, Ser. No. 865,259
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 11 Claims



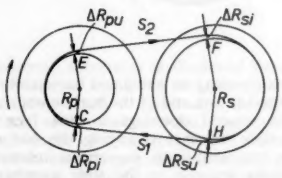
A positive drive, variable speed structure including an elongated slotted strip cut to length and looped with abutting ends to form a circular belt support and mounting means for the support, including pulley means having concentrically grooved opposing faces for reception of the strip support.

3,604,283

DRIVING MECHANISM

Hubertus Josephus Van Doorne, Stationsstraat 71, Eeurne, Netherlands

Filed Sept. 23, 1969, Ser. No. 860,235
Claims priority, application Netherlands, Sept. 23, 1968, 6,813,649
Int. Cl. F16g *1/00, 1/26*
U.S. Cl. 74—231 M 5 Claims



A driving mechanism with a driving pulley having a V-shaped circumferential groove and a driven pulley having a V-shaped circumferential groove. A flexible endless member having chamfered flanks interconnects and spans the pulleys. The diameter of the pulleys can be varied automatically and stepless with regard to each other so that different transmission ratios can be obtained. The flexible endless member consists of one or more layers of steel belts arranged with a mutual play that is greater than 0.3 × the thickness of the belt and smaller than 1.8 × the thickness of the belt.

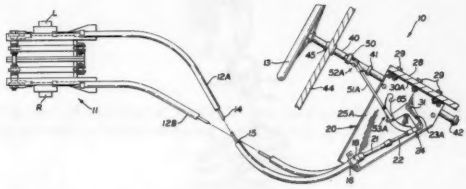
3,604,284

CONTROL DEVICE FOR APPLYING BALANCED FORCES TO A PAIR OF SERVIENT MECHANISMS

Richard D. Houk, Stow, Ohio, assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed May 25, 1970, Ser. No. 40,320
Int. Cl. G05g *9/00*
U.S. Cl. 74—491 12 Claims

A control device for applying balanced forces to a pair of servient mechanisms. The control device has a control shaft mounted for rotation and axial translation in a housing. A pair of force-transmitting devices in the form of a push-pull control cables operatively connect the control device to the corresponding servient mechanisms, which may be located remotely of the control device. The control device has a pair of throw members in the form of bellcranks rotatably mounted on the housing for applying compressive or tensile stresses to the core of each push-pull cable. The control device also has a pair of link arms. One end of each link arm is operatively connected to a corresponding bellcrank by a universal joint spaced radially of the control shaft. The opposite end of each link arm is operatively attached to a lever



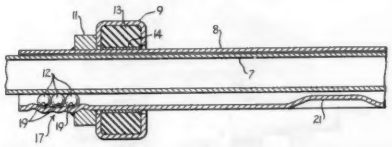
arm, also by universal joints, and the lever arm is affixed to the control shaft for movement therewith. This second pair of universal joints is preferably also spaced radially of the control shaft in order to preclude interference between the two link arms and the control shaft or the housing, particularly as the latter moves through its rotational range. In any event, the second pair of universal joints may not be located in a common plane with both the control shaft and the first pair of universal joints and at the same time be spaced at the same radial distance from the control shaft as the first pair of universal joints if all the objectives of the present invention are to be achieved.

3,604,285

ENERGY-ABSORBING DEVICE AND METHOD OF MAKING THE SAME

John Erland Sixten Olsson, Trollhattan, Sweden, assignor to Saab-Scania Aktiebolag

Filed Apr. 6, 1970, Ser. No. 25,982
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 5 Claims



The energy-absorbing device comprises telescoped inner and outer members between which hard balls are confined. Its inner member is a tube with a circumferentially undulating wall that defines circumferentially alternating inwardly and outwardly opening bays and is therefore radially elastically deformable. Balls are received at longitudinally spaced intervals in the radially outwardly opening bays. The outer member has a spherical inwardly opening socket for each ball to hold the ball against displacement relative to the outer member. When either member moves lengthwise relative to the other, the balls locally elastically deform the inner member, thus dissipating energy.

3,604,286

TOGGLE SWITCH LEVER

John B. Foreman, Sharon Hill, Pa., assignor to Controls Company of America, Melrose Park, Ill.

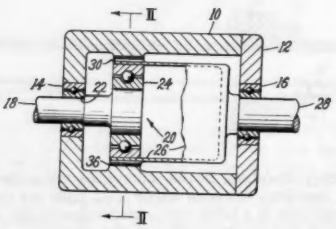
Filed Nov. 3, 1969, Ser. No. 873,182
Int. Cl. G05g *1/04*; H01h *21/06*
U.S. Cl. 74—523 4 Claims

The toggle switch actuator has a handle having a spherical portion which seats on the seat inside the bushing to provide the pivot action for the handle. The plastic insert in the bushing has a slot in which the handle portion having the opposed

flats is guided while handle rotation about its own axis is prevented. The spherical portion of the handle is captured between the seat and the insert. Ears on the insert project

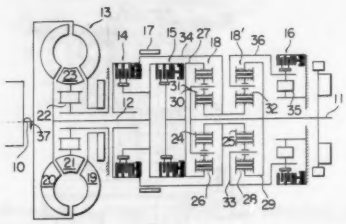
through slots in the bushing into slots in the mounting plate to prevent any relative rotation of the bushing, insert or plate. The end of the bushing is rolled over the plate to complete the assembly.

3,604,287
MODIFIED HARMONIC-DRIVE ACTUATORS
Donald R. Humphreys, Topsfield, Mass., assignor to USM Corporation, Boston, Mass.
Filed Aug. 5, 1969, Ser. No. 847,572
Int. Cl. F16h *37/00, 1/00*
U.S. Cl. 74—640 **8 Claims**



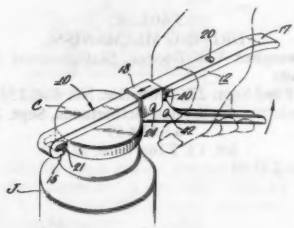
In contrast to providing a rigid circular spline for cooperating with a coaxial flexspline to effect spline-meshing at spaced circumferential localities, in accordance with conventional harmonic-drive actuation, there is provided in coaxial relation in a speed changer a "flexspline" having a rough working surface, and a cooperative "circular spline" elastomer, the latter being of suitable durometer and initially formed with a diameter slightly less than the root diameter of the "flexspline" measured at its major axis whereby, at spaced circumferential localities, the rough surface is impressed in driving relation into the elastomer. An axial deflection version is also disclosed. Alternatively, in either version the deflectable member may be elastomeric and the nondeflected member formed with a nonskid-cooperating surface.

3,604,288
ELECTRONIC CONTROL SYSTEM FOR AUTOMOTIVE AUTOMATIC TRANSMISSION
Yoichi Mori, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan
Filed Oct. 29, 1969, Ser. No. 872,308
Claims priority, application Japan, Oct. 30, 1968, 43/78831
Int. Cl. B60k *21/08;* **F16h** *5/42*
U.S. Cl. 74—864 **12 Claims**



A system for electronically controlling the line pressure in the hydraulic control circuit of an automatic transmission of an automotive vehicle, which pressure is changed with a voltage proportional to the engine torque or inversely proportional to the speed of the turbine shaft of a torque converter.

3,604,289
KITCHEN TOOL
Samuel Steel, 4902 N. 15th St., Philadelphia, Pa.
Filed Feb. 24, 1969, Ser. No. 801,697
Int. Cl. B67b *7/00*
U.S. Cl. 81—3.42 **6 Claims**

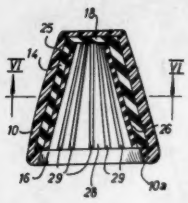


A device comprising an elongated bar member, a gripping member formed at one end of the bar member, a plurality of longitudinally spaced openings in one face of the bar member, a slide member overlying the bar member and adapted for back-and-forth movement relative thereto, a handle pivotally secured to the slide member, a latching member pivotally secured to the handle having a detent engageable in a selected opening in said bar member, and biasing means normally urging said latching member in a predetermined direction relative to said handle, pivotal movement of said handle toward said bar member operable to engage said detent in a selected opening in said bar member and thereby effect longitudinal movement of said slide member along said bar member toward said gripping member.

3,604,290
APPARATUS FOR RELEASING CLOSURE MEMBERS
John L. Waite, Lyndhurst Meols Dr., West Kirby Wirral Cheshire, England
Filed July 9, 1969, Ser. No. 840,277
Claims priority, application Great Britain, July 18, 1968, 34149/68
Int. Cl. B67b *7/18*
U.S. Cl. 81—3.4 **6 Claims**

There is disclosed a device for releasing closure members from containers. The device has a frustoconical-shaped body

member of a relatively rigid material which has a frustoconical-shaped recess therein. Within the recess is located a frustoconical-shaped gripping member of a resilient material, which is open ended at its larger end and able to engage a closure member. The body member and gripping member are

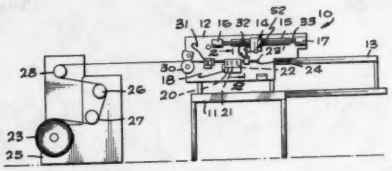


restrained from relative movement, and by engaging the gripping member on the outside of a closure member, a person may apply torque to the body member and thus to the closure member. Thus by imparting relative angular displacement between the container and its closure member, the closure member may be removed from the container.

3,604,291
WIRE STRIPPING APPARATUS

August Weidner, Los Angeles, Calif., assignor to Thomas Organ Co., a subsidiary of Warwick Electronics Inc., Chicago, Ill.

Filed Jan. 21, 1969, Ser. No. 792,531
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.51 **2 Claims**



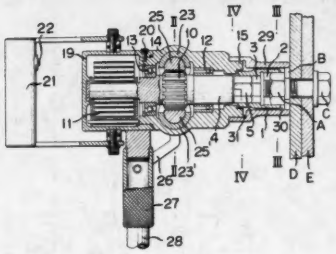
A wire-stripping apparatus is disclosed herein having a cutter adapted to sever insulation from the ends of a pair of separate wires preparatory to removal of the severed insulation from each of the wires. Also, the cutter severs a predetermined length of wire from a coil stored on a reel. The apparatus includes a gripping means having a pair of cooperating grippers adapted to clamp about the insulated wires so that the wires are positively retained during the cutting and stripping procedure. Linkage means, including an eccentric pivot connection, actuates the pair of grippers in response to control means for automatically clamping and releasing the pair of wires simultaneously.

3,604,292
BOLT AND NUT FASTENING DEVICE

Toyoji Sada, Niigata Prefecture, Japan, assignor to Riken Seiki Kabushiki Kaisha, Niigata-ken, Japan and Riken Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 6, 1969, Ser. No. 789,200
Claims priority, application Japan, Feb. 8, 1968, Feb. 14, 1968, Feb. 15, 1968, Feb. 14, 1968, Feb. 19, 1968, 8027/1968;10624/1968;11149/1968;79629/1968;81376/1968
Int. Cl. B25b *17/00, 21/00*
U.S. Cl. 81—57.11 **4 Claims**

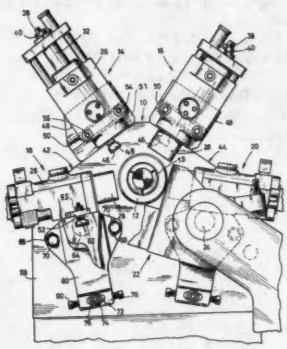
This bolt and nut fastening machine has a structure wherein comprising an outer barrel that includes a nut-engaging spanner to screw up automatically a nut by a suitable driving means and a washer-engaging member fitted at the top end of said barrel to catch and hold a polygonal washer of nut and to be constructed rotative only in one direction.



3,604,293
MACHINE TOOL

Gerhard Foll, and Helmut Link, both of Esslingen, Germany, assignors to Index-Werke K. G. Hahn & Tessky, Esslingen (Nekar) Germany

Filed Sept. 10, 1968, Ser. No. 758,738
Claims priority, application Germany, Sept. 14, 1967, P 16 02 839.0
Int. Cl. B23b *21/00*
U.S. Cl. 82—24 **10 Claims**



A turning lathe wherein the headstock for the work spindle mounts at least one first support. The first support is reciprocable in parallelism with the axis of the work spindle or is pivotable about an axis which is parallel to the axis of the work spindle. Such first carriage supports a second support which is movable thereon substantially or exactly at right angles to a line extending radially from the work spindle and in the general direction of the second support. A cross-slide is mounted in the second support for movement radially of the work spindle and can be shifted by a piston which is reciprocable in the housing of the second support.

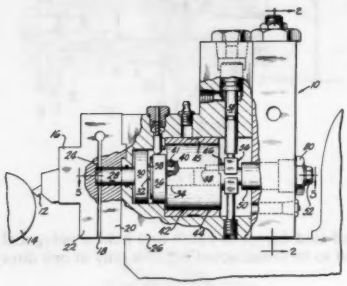
3,604,294
TWO DIRECTIONAL TOOL ADJUSTING APPARATUS

Archibald S. Mitchell, East Detroit, Mich., assignor to La Salle Machine Tool, Inc., Warren, Mich.

Filed Dec. 3, 1969, Ser. No. 881,729
Int. Cl. B23b *21/00*
U.S. Cl. 82—24 **6 Claims**

Apparatus for periodically adjusting the position of a machine tool, such as a cutting tool, to compensate for tool wear and changing heat conditions, for example, to enable continuous accurate positioning of the tool. In response to a signal indicating the necessity for adjusting the position of

the cutting tool, a cam and cam follower structure are movable in either of two opposite directions to provide for adjustable movement of the tool in either of two directions through a predetermined incremental distance. A clutch and brake



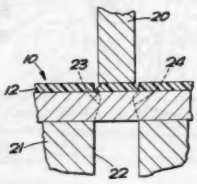
assembly are sequentially operable to enable reversible adjustable movement of the tool. In addition, a manually rotatable shaft is operable to reset the cam and cam follower structure to a zero position.

3,604,295

METHOD OF CUTTING LAMINATED STRIP MATERIAL

Martin Ronald Newton Clark, Ickenham; Joseph Henry Hill, Greenford, and Herbert Ernest Preston, Maidenhead, all of, England, assignors to Vandervell Products Limited, London, England

Filed Feb. 2, 1970, Ser. No. 7,697
Claims priority, application Great Britain, Feb. 7, 1969, 6823/69
Int. Cl. B26d *3/00, 11/00*
U.S. Cl. 83—9 **4 Claims**



A method of cutting laminated strip material of the type having a hard backing with a soft layer bonded to the backing comprising cutting through the soft layer to the interface with the backing and then shearing through the backing along a line extending to one side of one of the faces formed on the soft layer by the first cutting operation so that the bond between the part of the soft layer on which said one face is formed and the backing is not damaged by the second cutting operation.

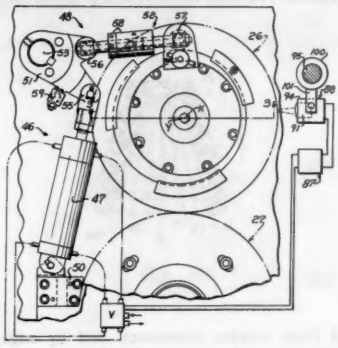
3,604,296

MATERIAL CUTTING METHOD AND APPARATUS

Albert J. Sarka, Fairview Park, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Oct. 4, 1968, Ser. No. 765,150
Int. Cl. B23d *25/02;* **B26d** *5/00*
U.S. Cl. 83—37 **9 Claims**

Apparatus for cutting material comprises first and second rotatable members defining a nip through which the material passes and at which cutting is effected by dies carried by the rotatable member. Actuating means operates to shift one of the members away from the other member to render the dies ineffective to cut the material. The actuating means is operated in response to the presence of a previously cut portion of material being carried on a die plate carried by one of the members.

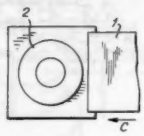


3,604,297

METHOD OF MANUFACTURING TWO CONCENTRIC PARTS THROUGH DIE BLANKING OF STEEL STRIPE

Vitaly Konstantinovich Gilev, 811 proezd, 65, kv. 16; Volf Nakhimovich Evzlin, ulitsa Chapaeva 102, kv. 53; Rafael Tevosovich Sarkisov, ulitsa Aga-Neimatully, 20-a, blok 3, kv. 28, and Ernst Arakelovich Stepanyan, ulitsa Druzhby Molodezhi 2, kv. 36, all of, Baku, U.S.S.R.

Filed Aug. 29, 1969, Ser. No. 854,193
Claims priority, application U.S.S.R., Mar. 6, 1969, 1304654
Int. Cl. B26d *7/18*
U.S. Cl. 83—50 **1 Claim**



The present disclosure relates to methods of manufacturing two concentric parts through die blanking, according to which a circular part and a central portion which is another part workpiece are simultaneously blanked from a strip in the upper die. During the opening of the upper die, the other part workpiece is separated, transferred downwards and held above the lower die until the latter opens, the strip leftover is removed from the upper die matrix and the strip moved by a blanking pitch, a ready part being picked up from the die punch during the last period of said die opening. When the punches' movement changes to reverse, the other part workpiece is let into the opening lower die and then placed on the die matrix, a ready part blanked during the previous cycle being removed from the punch of said die.

3,604,298

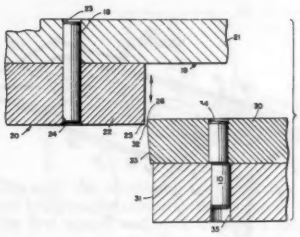
DIE SET FOR PUNCH PRESS HAVING ADJUSTABLE DIE ALIGNING MEANS

Chester Dekiel, 21 W. 185 River Drive, Glen Ellyn, Ill.

Continuation of application Ser. No. 719,050, Apr. 5, 1968, now abandoned. This application July 7, 1969, Ser. No. 845,627
Int. Cl. B26d *1/10;* **F16h** *33/10*
U.S. Cl. 83—694 **2 Claims**

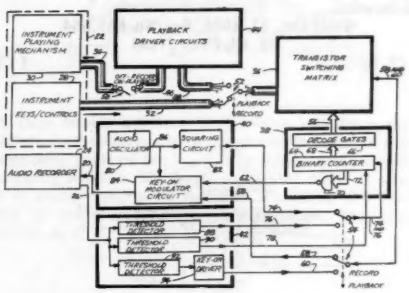
A die set for a punch press including a reciprocable die unit and a stationary die unit having coacting shearing edges spaced apart a desired distance and means for readjusting the desired spacing after one of the shearing edges has been

reground comprising a plurality of dowel pins. Each of the dowel pins consists of two axially offset cylindrical segments



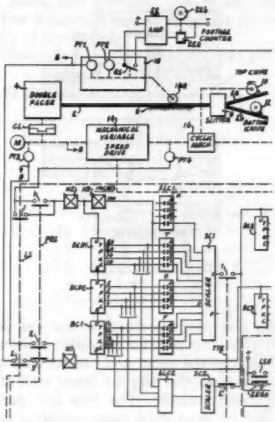
joined together at their bases to define a pair of crescent-shaped shoulders.

3,604,299
METHOD AND APPARATUS FOR RECREATING A MUSICAL PERFORMANCE
Edward J. Englund, 4631 S. 282 St., Auburn, Wash.
Filed Apr. 22, 1970, Ser. No. 30,638
Int. Cl. G10f *1/00*
U.S. Cl. 84—1.03 **18 Claims**



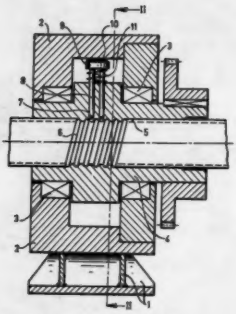
A distinct signal is provided throughout the actuation of each control of an instrument, such as during the depression of each key. The relative time occurrences of these performance signals are determined by assigning to each a separate count in a repeated train of gating pulses. The pulse train is produced by a gating means stepped by clock pulses from an oscillator. When coincidence between a performance signal and a corresponding one of the gating pulses is detected, a matrix provides a "key-on" signal to a modulator which is also supplied with the clock pulses. This modulator develops a composite signal or sinusoidal waveform which includes a sync level once every pulse train, a clocking level for every clock pulse during which there is no key-on signal, and a key-on level for every clock pulse during which there is a key-on signal. The waveform may be recorded for later playback or transmitted to a remote location for immediate playback. In playback, the method described above is simply reversed in which the waveform is demultiplexed to provide a plurality of control signals whose presence corresponds to the desired time occurrences of each instrument. By coupling these signals to appropriate drivers, such as relays, the playing mechanisms of the instrument may be actuated to duplicate the original musical performance. Embodiments of the system for use with an organ and for use with a piano are described, as are specific embodiments of the system elements. Modifications to allow operation of a remote keyboard and to provide keyboard transposition and coupling are shown.

3,604,300
FREQUENCY BASE KNIFE CONTROL SYSTEMS
Arthur F. Allison, Richfield, and Siegfried R. Salzbrenner, Milwaukee, both of, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed June 24, 1969, Ser. No. 835,945
Int. Cl. B26d *5/24*
U.S. Cl. 83—76 **19 Claims**



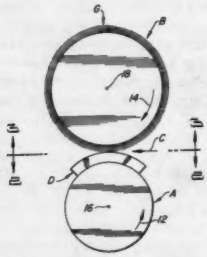
Digital systems for controlling continuously rotating, variable-speed cutoff knives to provide precise control of the lengths of sheets cut from high-speed moving corrugated boards or webs. A main motor acts through a clutch to drive a double-facer that forms and advances a continuous strip of corrugated board. A slitter slits the board at the middle to form two strips. A top knife cuts one of the strips into sheets and a bottom knife cuts the other strip into sheets. The main motor drives a mechanical variable speed (Reeves) drive and a cyclic mechanism for each knife. Each knife is provided with a frequency based control system that acts through an associated correction motor to adjust its Reeves drive closely to control the cutoff length to a selected value. For this purpose, a web rider generates a reference pulse for each one-sixteenth inch of board. A tachometer generator provides 1,600 feedback pulses each revolution of the knife, a portion of which may be preselected at thumb wheel switches to select the desired length of sheets. The frequency based control system responds to the frequency and phase of preselected feedback pulses and the reference pulses to provide a knife speed correction signal and a position or phase correction signal for precise control of the correction motor at any time that there is error. The system is preset by first switching from the web rider pulse generator to a preset pulse generator operated from the main motor to adjust the system close to the desired cutoff length before any board is run to prevent waste. A second set of thumb switches affords presetting of the sheet length for the next order while the system is running preparatory to switchover. A presettable sheet counter automatically displays the number of sheets remaining to be cut and stops the system when the selected number of sheets has been cut or may be used to start operation of an automatic order changer. An add-on counter allows selection of an additional number of sheets to be cut while the system is operating. A sheet length readout displays the actual cut length of alternate sheets within a hundredth of an inch. A footage counter displays the total length of board used on an order in 10 foot increments.

3,604,301
A DEVICE FOR CUTTING APERTURES IN THE WALL OF A PLASTIC TUBE
Cornelis Van Zon, Swolle, Netherlands, assignor to Wavin N. V., Zwolle, Netherlands
Filed Aug. 29, 1968, Ser. No. 756,237
Claims priority, application Netherlands, Sept. 1, 1967, 6712017
Int. Cl. B26d *5/16*
U.S. Cl. 83—358 **4 Claims**



A device for stamping apertures in the wall of a corrugated thermoplastic tube comprises a rotatable hollow nut for guiding the outer wall of the tube, and bits for stamping apertures in the tube without supporting the inner wall of the tube during stamping from outside. The bits are depressed in the plastic material by operating cams or by a guiding groove. Preferably the bits are effective in the area just besides the profiled end of the nut.

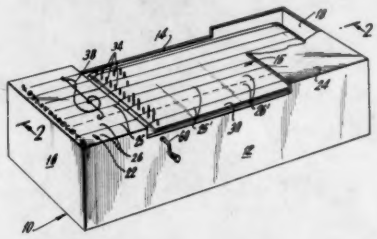
3,604,302
BRUSH ANVIL
Craig W. Smythe, Muncie, Ind., assignor to Dovey Manufacturing Company, Anderson, Ind.
Filed Feb. 13, 1970, Ser. No. 11,174
Int. Cl. B26d *7/20, 1/56*
U.S. Cl. 83—659 **11 Claims**



An anvil for a rotary cutting device including a section having brush bristles with terminal ends defining a cylindrical anvil surface against which a cutting knife operates.

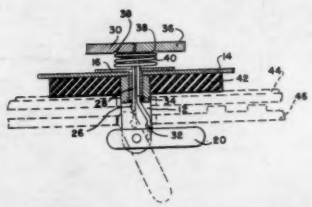
3,604,303
MUSICAL COMPOSITION DEVICE
Joseph Williams, 120 East 89th St., New York, N.Y.
Filed June 20, 1969, Ser. No. 835,177
Int. Cl. G10f *1/06*
U.S. Cl. 84—101 **10 Claims**

A musical device permits visual and easy song composition and the arrangement of note actuators which may be selected for playing an infinite variety of melodies may be employed as an educational device or as a toy. The device includes a housing having a top plate with a musical staff, notes and similar musical symbols indicated thereon. The housing has an opening at its top which is aligned with the indications and which is provided for the movement of a belt therethrough.



The belt carries a plurality of staff lines which align with the staff lines of the indication on the housing panel and in addition it is provided with a plurality of rows which either contain openings for receiving a note-playing peg or is provided with peg elements which may be extended to position them outwardly in the form of note playing pegs.

3,604,304
DUCT JOINT PIN
Harry A. Botting, Long Beach, Calif., assignor to The United States of America as represented by the Secretary of the Army and/or the Administrator of the Federal Aviation Administration
Filed Oct. 27, 1969, Ser. No. 869,664
Int. Cl. F16b *21/00*
U.S. Cl. 85—3 R **1 Claim**

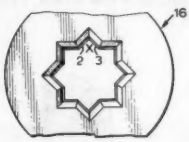


A duct joint pin for joining apertured metal sheets or the like and for sealing the apertures of the metal sheets. The pin has a latch pivotally mounted on one end, a tubular body, and a flange on the end opposite the latch with a depending sealing O-ring. A pair of levers extend from heads located outside the tubular body through the tubular body to ends adapted to engage the latch selectively to position the latch in either substantial alignment with the tubular body for insertion in or removal of the pin from the apertured metal sheets, or in a locking position transverse to the tubular body of the pin. The locking of the latch retains the sealing O-ring depending from the flange of the tubular body in sealing engagement with the apertured metal sheets. A sealing ring is positioned in the tubular body of the pin to surround the levers and seal off the area between the levers and the inside of the tubular body.

3,604,305
RECESSED SCREW
Geoffrey Dreger, Rexdale, Ontario, Canada, assignor to P. L. Robertson Mfg. Co. Limited
Filed June 23, 1969, Ser. No. 835,518
Int. Cl. F16b *23/00*
U.S. Cl. 85—45 **1 Claim**

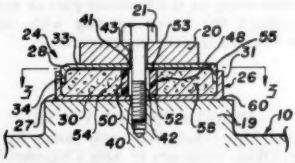
A screw having a recess formed in the head thereof centered on and symmetrical with respect to the screw axis, the recess presenting in plan 8 symmetrically disposed corners in

45° spaced relation with any four alternate corners proceeding around the recess lying on the corners of a square and defining a recess portion adapted to receive a square cross



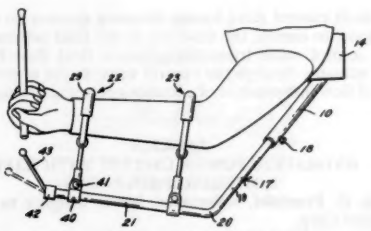
section driving tool, the remaining four alternate corners of the recess also lying on the corners of a square in 45° angular relation to the first square and also defining a recess portion adapted to receive a square cross section driving tool.

3,604,306
ADJUSTABLE MOUNTING SHIM
Gordon G. Denholm, 789 W. Pender St., Vancouver, British Colombia, Canada
Filed Aug. 7, 1969, Ser. No. 848,226
Int. Cl. F16b *43/00, 43/02*
U.S. Cl. 85—50 AT **5 Claims**



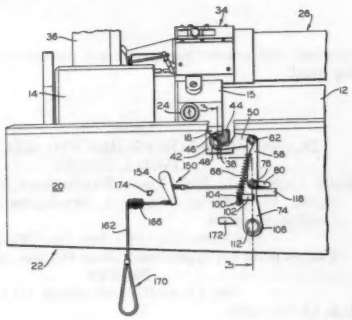
A shim having a hollow body which initially is given a predetermined thickness by a compressible member separating opposing parts of the body. The hollow body provides a mold cavity which is filled with a castable material after the shim is compressed to a required thickness, the material setting to retain the body permanently at the required thickness.

3,604,307
DRUM TEACHING AID
Anthony J. Vono, 115 Parhurst Rd, Warwick, R.I.
Filed June 22, 1970, Ser. No. 48,052
Int. Cl. G09b *15/06*
U.S. Cl. 84—465 **10 Claims**



In teaching a pupil to drum, one of the most difficult things is the correct position of the left arm and hand and the maintaining of this position. The device comprises an elongated support which can be clamped to one leg of the stool or chair on which the pupil sits. The support extends outwardly in the form of a metal tube in spaced parallel relation to the correct position of the arm. Clamped along the tube in adjustable position are a pair of members which form an adjustable opening through which the arm extends loosely. In view of the different sizes of people and the different lengths of their arms, adjustment must be made for the position of the two members and for their size. The bottom portion of each guide member is resiliently closed by a springlike member which permits the arm to be dropped out and to be readily moved upwardly into the guide. The pupil need pay no attention to the position of the arm, but can feel the arm touching the sides of the guides when the arm moves out of correct position.

3,604,308
MEANS FOR RELEASABLY LATCHING A RECOILING MASS AGAINST COUNTERRECOIL MOVEMENT
Robert J. Schulz, Davenport, Iowa; Jimmy H. Williams, Bettendorf, Iowa, and Robert J. Seamands, Moline, Ill., assignors to The United States of America as represented by the Secretary of the Army
Filed July 11, 1969, Ser. No. 841,013
Int. Cl. F41f *19/16*
U.S. Cl. 89—42 B **17 Claims**

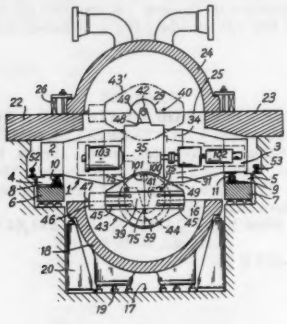


In a large caliber gun of the type in which the firing must be completed during the counterrecoil stroke thereof, the releasable retention of the recoiling parts in a stationary position is accomplished by a latch fixed to one end of each of a pair of linkages pivotally mounted to the respective opposite sides of the stationary cradle in which the recoiling parts are slidably mounted. Each linkage is formed by a plurality of links pivoted end to end and arranged to be pivoted by a cam on the recoiling parts of the gun whereby the latches are lifted into the counterrecoil path of the parts. This pivotal actuation of the linkages is arranged to be halted with a minimum of rebound in a position in which the latches are rigidly supported thereby against the counterrecoil force of the recoiling parts and yet can be rapidly collapsed to release the parts in response to the relatively light pull of a manually operable lanyard.

3,604,309
MACHINE TOOL FOR INTERNAL MACHINING OF A HOLLOW WORKPIECE CONSTITUTED BY TWO HALF SHELLS
Charles William Berthiez, 5 Avenue Sglantine, Lausanne, Switzerland
Filed Apr. 10, 1969, Ser. No. 815,065
Claims priority, application France, Apr. 11, 1968, P.V. 147,796
Int. Cl. B23c *3/02*
U.S. Cl. 90—15 **12 Claims**

A machine tool for internal machining of a hollow workpiece of large dimensions constituted by two half shells which are to be assembled along joining planes. The machine tool has support means for the two half shells to support the half shells opposite one another at a distance and a movable member and means to move said member between the two

half shells in a direction parallel to the joining planes of the half shells. A machining head is mounted on the movable

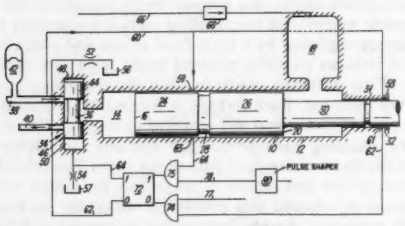


member and machining means are mounted on the machining head.

3,604,310
TRANSDUCER FOR PRODUCING MECHANICAL OSCILLATIONS

Keith Foster, 112 Hole Lane, Birmingham 31, England, assignor to National Research Development Corporation, London, England

Filed Jan. 15, 1969, Ser. No. 791,250
Claims priority, application Great Britain, Jan. 16, 1968, 2434/68
Int. Cl. F01l *25/06*; **F01b** *7/18*
U.S. Cl. 91—306 **12 Claims**

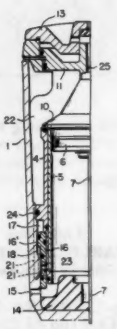


A transducer adapted to be driven by pressure fluid to produce mechanical oscillations, comprising a piston member and a cylinder member mounted for relative oscillating movement, the piston member having a face bounding a chamber in the cylinder member, valve means for cyclically pressurizing and depressurizing said chamber with pressure fluid to cause said relative oscillating movement, control means adapted to generate a first position signal as the members move relatively through a first relative position, and to generate a second position signal as the members move relatively through a second relative position, means to pass said position signals to control means including a bistable element which is adapted to control the valve means in response to said position signals the control means responding only to those first position signals, generated as the members move relatively in one sense through the first relative position, and only to those second position signals generated as the members move relatively in the opposite sense through the second relative position.

3,604,311
COMPRESSED AIR NAILING MACHINE

Umberto Monacelli, Via del Parco, Biassono, Italy

Filed July 14, 1969, Ser. No. 841,360
Claims priority, application Italy, July 19, 1968, 19181 A/68
Int. Cl. F15b *11/08*, *13/042*
U.S. Cl. 91—404 **2 Claims**

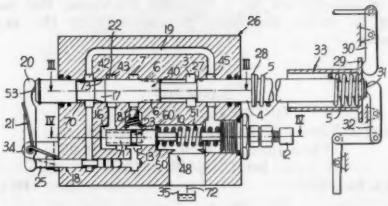


A compressed air nailing machine comprising a flanged ring nut which slides on the terminal part of the cylinder in order to connect the lower opening with either the atmosphere or the compressed air reservoir.

3,604,312
DRAFT CONTROL VALVE

John R. Plate, Milwaukee, Wis., and James R. Mc Burnett, Stillwater, Okla., assignors to Allis Chalmers Manufacturing Co., Milwaukee, Wis.

Filed Oct. 23, 1969, Ser. No. 868,730
Int. Cl. F15b *11/08*
U.S. Cl. 91—433 **10 Claims**



A draft control valve having metering grooves on the control spool to control the flow rate to the fluid actuator and a flow control valve transmitting return fluid flow from the fluid actuator through the control valve to the reservoir at a rate of flow independent of actuator operating pressure.

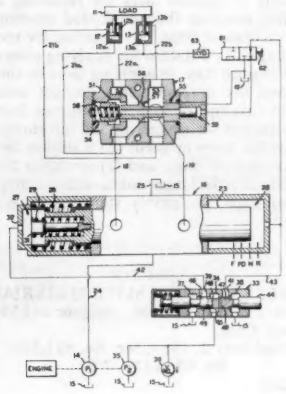
3,604,313
HYDRAULIC POWER CIRCUIT WITH RAPID LOWERING PROVISIONS

Waldo G. Fruehauf, Kalamazoo, Mich., assignor to General Signal Corp.

Filed May 14, 1970, Ser. No. 37,114
Int. Cl. F15b *11/08*, *13/04*
U.S. Cl. 91—438 **5 Claims**

A hydraulic power circuit especially useful as a lift circuit for front-end loaders and including a bypass valve separate from the directional control valve which is adapted to interconnect the contracting and expanding ends of the actuating cylinders and permit rapid lowering of the implement. The circuit is characterized by an actuating scheme for the bypass valve which opens that valve only when the directional con-

trol valve is shifted to float position and the load pressure in the contracting ends of the cylinders is below a preselected value. The directional control valve may be shifted by pilot



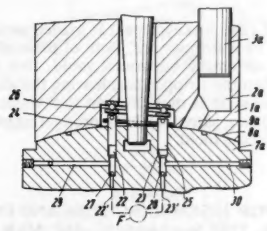
pressures, and in this case the motive force for opening the bypass valve may be developed by the pressure in the pilot circuit.

3,604,314

HYDROSTATIC AXIAL PISTON MACHINE

Heinrich Steiner, Monchengladbach, Germany, assignor to Mannesmann-Meer A.G., Monchengladbach, Germany

Filed May 7, 1969, Ser. No. 824,738
Claims priority, application Germany, May 6, 1968, P 17 03 347.5
Int. Cl. F04b *1/02*
U.S. Cl. 91—485 **4 Claims**



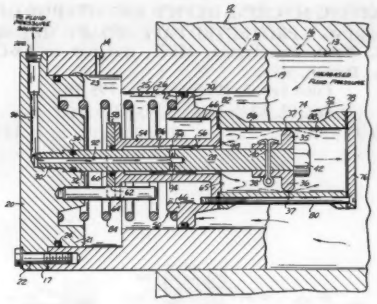
A hydrostatic axial piston machine has a control block, a mirror surface thereon, a cylinder drum rotatably supported by said mirror surface, and dosing means assuring a metered supply of lubricating liquid to the mirror surface.

3,604,315

FLUID PRESSURE DEVICE

Nils O. Rosaen, Bloomfield Hills, Mich., assignor to Universal Filters Inc., Hazel Park, Mich.

Filed June 5, 1969, Ser. No. 830,630
Int. Cl. F01b *3/00*
U.S. Cl. 92—110 **12 Claims**



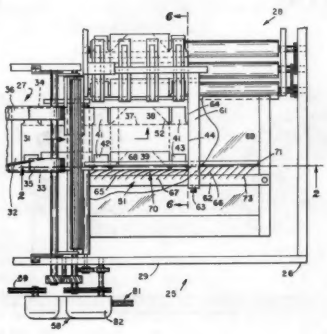
A fluid cylinder and piston assembly for use in a fluid filter assembly or the like, which includes a housing and a cover; a spring-biased compound piston and cylinder assembly is reciprocable within the housing on a stationary guide rod attached to the cover of the housing. The compound piston and cylinder assembly defines a pressure chamber having a plunger attached to the end of the guide rod disposed therein and the chamber is in communication in front of the plunger with a fluid inlet in the cover by means of restricted passages to move the compound piston and the cylinder assembly in one direction and the plunger is constructed such as to permit metered amounts of fluid to the plunger within the cylinder at a predetermined fluid pressure to move the compound piston and cylinder assembly in the other direction.

3,604,316

UNTIMED MECHANICAL TRANSFER MEANS FOR RIGHT ANGLE FOLDING MACHINES

Raymond A. Labombarde, 24 Marlow Rd., Nashua, N.H.

Filed Mar. 2, 1970, Ser. No. 15,562
Int. Cl. B31b *1/26*
U.S. Cl. 93—49 R **13 Claims**



An untimed, mechanical transfer apparatus, for resiliently flicking each successive box blank received from a first flap-

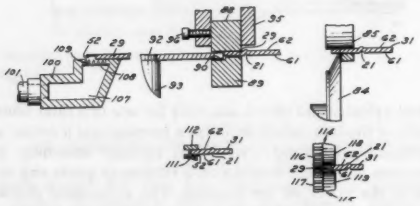
folding apparatus laterally at right angles into the control of a second flap-folding section. Rotating nip roll means in a transfer zone retains a grip on each advancing blank while the side edge of the blank successively engages a row of individual spring members, the springs rebounding to flick the blank when the trailing edge of the blank is released from the roll nip.

3,604,317

SKIVING MACHINE DEVICE AND METHOD OF PREPARING A PROTECTED PAPERBOARD SIDE SEAM

Eric A. Baun, Farmington, Mich., assignor to Ex-Cell-O Corp., Detroit, Mich.

Filed Feb. 3, 1969, Ser. No. 795,791
Int. Cl. B31b *1/14, 1/64;* **B31c** *5/00*
U.S. Cl. 93—58 ST **3 Claims**



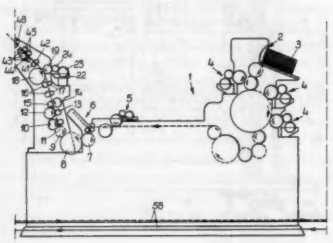
An improved skiving machine device and a new method for preparing and forming paperboard side seam blank providing it for a smooth edge which a roughened skived surface can fold around and adhesively secure to its adjacent surface forming a protected edge for the side seam flap of a paperboard container blank with contact being made between the roughened paper surface and the adjacent side seam flap giving good bond characteristics and accuracy.

3,604,318

MACHINE FOR MAKING ENVELOPES WITH MOISTENABLE OR SELF-SEALING CLOSURE FLAPS

Richard Winkler, Burgermeister-Win k-Strasse, 5455, Rengsdorf, and Kurt Dunnebier, am Burkenhang 5451, Gladbach, both of, Germany

Filed May 2, 1969, Ser. No. 821,293
Claims priority, application Germany, Dec. 28, 1968, P 18 17 297.9
Int. Cl. B31b *21/02, 21/26, 1/62*
U.S. Cl. 93—74 **2 Claims**



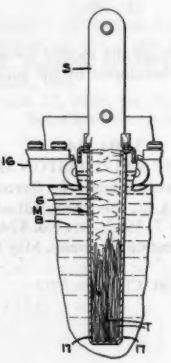
Envelopes or flat bags are made with closure flaps which are either gummed with dextrin or a similar substance which becomes adhesive when moistened, or the flaps and their corresponding contact areas of the rear side are both gummed with latex or similar adhesive which sticks in the dry state. These gumming operations are carried out in a single pass through a machine which includes an envelope-folding machine which may have stations for printing and embossing the envelopes or bags and making windows or sticking linings therein and which forms a single structural unit with the following consecutively arranged stations: (a) a station composed preferably of suction discs for receiving individually from the folding machine finished folded envelopes or bags with ungummed closure flaps; (b) a station for reopening the envelopes or bags; (c) a station for applying either dextrin or the like to the closure flap, or applying latex or the like to the closure flap and the corresponding contact area upon the rear side of the envelope or bag, at a distance from the edges thereof; (d) a station for staggering the envelopes or bags to which adhesive has been applied; (e) a station for drying the staggered envelopes or bags; and (f) a station for collecting finished envelopes or flat bags either with closure flaps open or with folded flaps, preferably standing on edge upon a delivery table.

3,604,319

FREEZE MOLDING SLICE MATERIAL

Katsuji Hirahara, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed May 2, 1969, Ser. No. 821,210
Int. Cl. A47j *47/02*
U.S. Cl. 99—269 **3 Claims**



Slice material (e.g. turkey slices) is loaded onto a loading tray backed up by a stripper bar. Both of these elements are projected into an empty horizontal mold, first the tray is retracted and then the stripper bar, leaving the slice material in the mold. The mold is then brought to a vertical position, filled with liquid (e.g. gravy) and the product aggregate is immersion frozen in the mold.

3,604,320

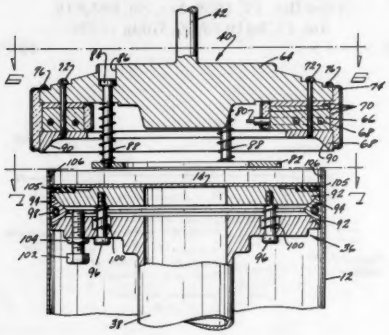
APPARATUS FOR ASSEMBLING TUBE AND END PANEL

Alvin C. Duvall, 2727 Southwick St., Ida, Mich.; James C. Jones, 3304 River Road; George R. Kramp, 1249 Wildwood, Toledo, Ohio, and James L. Swickard, Jr., 735 Southwood Dr., Uniontown, Ohio

Filed Sept. 17, 1969, Ser. No. 858,605
Int. Cl. B31b *17/00*
U.S. Cl. 93—55.1 R **6 Claims**

Novel assembly means adapted to produce a unique package particularly suited for use in conjunction with asphalt wherein a fiber bottom is sealed to a fiber tube by means of a heat and pressure sensitive adhesive. The as-

sembly means includes three mandrels mounted on a revolving spider and a heated sealing platen. In operation, a cylindrical paper tube is placed over one of the mandrels so that its upper edge extends beyond the upper end of the mandrel. The paper tube includes approximately a one-inch strip of heat and pressure sensitive adhesive which has been coated around the inner periphery of its upper edge. A paper bottom



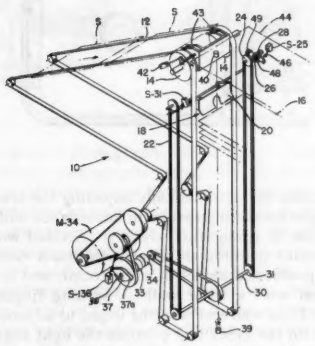
is positioned within the upper end of the paper tube and rests against the upper end of the mandrel. Once loaded, the mandrel is rotated into a sealing position where the heated sealing platen cooperates with the mandrel to crimp the adhesive coated end of the paper tube into sealed engagement with the paper bottom. The mandrel is then revolved to a third position where the sealed package is removed from the assembly means.

3,604,321

PROGRAMMED SHEET DISTRIBUTING DEVICE

Donald L. Snellman, Seattle; Ernest D. Davis, Richmond Beach, and Dale R. Johnson, Seattle, all of, Wash., assignors to Norfin, Inc., Seattle, Wash.

Filed June 2, 1969, Ser. No. 829,274
Int. Cl. B65h *33/14*
U.S. Cl. 93—93 C **6 Claims**



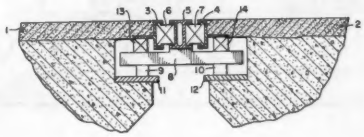
A deflector of a sheet distributing mechanism is positioned at selected stations in response to the passage of sheets past the deflector. A manually programmed crossbar switch determines the preselected numbers of sheets to be distributed to any one of several stations. A sheet stepping switch and a station stepping switch join the programmed crossbars of the crossbar switch when the programmed number of sheets have been received at the selected station so as to index the deflector to the next station. The number of sheets and the number of stations programmed may be varied, stations may be skipped or the device may operate as a collator by distributing a single station at a time to one or more of the sheets. An anticipating device is employed on the station stepping switch to permit smooth operation of the distributing mechanism when several stations are to be skipped.

3,604,322

BRIDGING OF EXPANSION JOINTS IN ROADWAYS OF BRIDGES, STREETS, RUNWAYS AND THE LIKE

Waldemar Koster, Forsbach, Germany, assignor to Friedrich Sohne Maurer, Stahlbau, Munich, Germany

Filed Aug. 23, 1968, Ser. No. 754,806
Int. Cl. E01c *11/10*
U.S. Cl. 94—18 **5 Claims**



The edges of the expansion joint between two roadway sections are terminated with adjoining edge profiles, respectively. One or more longitudinal retaining members pass parallel to said edge profiles and are connected to the latter and to each other by means of flexible sealing members. Each retaining member is fixedly connected with two parallel supporting traverses disposed in the direction of the roadway in a recess below the edge profiles. Each of said traverses slidably rests on two sliders supported on fixed mounting plates. In addition to the system of elastic sealing members, a system of elastic spring members is provided. The latter members act between the traverses and the edges of the expansion joint. By the combined elastic systems, the retaining members (if more than 1) are approximately equally spaced from one another. The retaining members (as a unit) are held approximately in the middle between the edge profiles in any position of the expansion joint.

3,604,323

PRODUCT FOR THE PROTECTION OF CONCRETED COVERINGS AND METHOD OF USING SAID PRODUCT

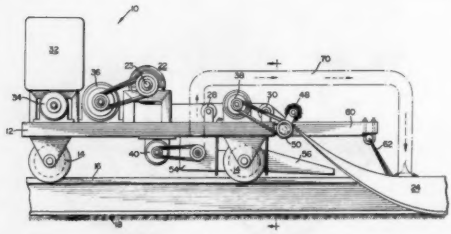
Claude A. Baumann, Strasbourg-Meinau, France, assignor to Huileries Alsaciennes S. A., Strasbourg-Port-du-Rhin (Bas-Rhin), France

Filed Jan. 14, 1969, Ser. No. 791,144
Claims priority, application France, Jan. 17, 1968, 9067
Int. Cl. E01c *21/00*
U.S. Cl. 94—22 **6 Claims**

A product and a method of using same for the protection of concrete coverings against damage due to the use of salts for the removal of slippery ice, in which for the removal of the traces of a liquid membrane curing compound (LMCC) remaining on the roadway, the latter is dissolved into a mixture according to French Patent Specification No. 1526001 (which is formed by a balanced mixture of a blown, oxidized, boiled linseed oil with addition of salts of lead, manganese and cobalt of an aliphatic solvent, which has a density of 0.772, which distils between 168 and 195° C., has a kauri-bu-

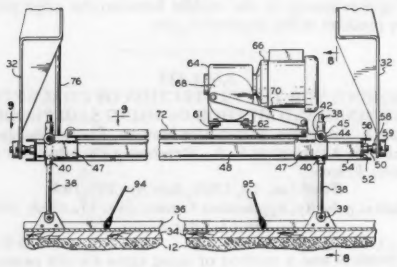
tanol index of 30, an aniline point of 73, a sulfur content of less than 20 parts per thousand, an aromatic content of less than 5 percent and a flash point lying above 55° C., but by replacing the solvent contained in this product by an aromatic or chlorinated solvent, such as trichloroethylene, xylene, toluene, etc., in such quantity that the mixture including the traces of the after-treatment product LMCC possesses a viscosity which renders its penetration as impregnation products into the concrete possible, the quantity of active product being the same as that in the mixture forming the object of the mentioned patent French specification.

3,604,324
CURING BLANKET AND MACHINE
William F. Middlestadt, Rt. 2, Box 330, Baltimore, Md.
Filed Feb. 6, 1969, Ser. No. 796,977
Int. Cl. E01c *23/03*
U.S. Cl. 94—39 **5 Claims**



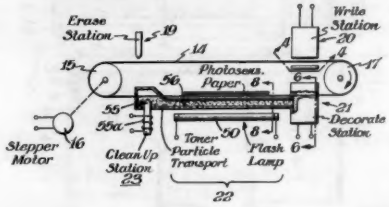
A flexible concrete curing blanket of indefinite length is provided with tubes along its sides. The tubes are filled with water to weight and thus hold the blanket down. A self-propelled machine lays the blanket down on top of freshly poured concrete, the machine takes the blanket up when the concrete has cured.

3,604,325
MACHINE FOR FINISHING CONCRETE SURFACES
John A. Borges, 601 Duane Avenue, Oregon City, Oreg.
Filed Dec. 9, 1968, Ser. No. 782,147
Int. Cl. E01c *19/22*
U.S. Cl. 94—45 **14 Claims**



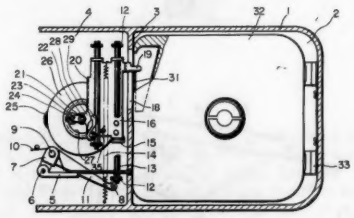
A machine for smoothing the surface of newly poured concrete including a float which is moved across the concrete surface by a carriage traveling back and forth on an overhead frame spanning the surface. The float is vertically self-adjusting and reciprocates lengthwise as it moves across the concrete surface. The machine also includes a tilt adjustment, pressure adjustment and skew adjustment for the float and means for lifting and lowering the float to the concrete surface.

3,604,326
METHOD AND APPARATUS FOR MAGNETIC-OPTICAL PRINTING
Edward W. James, II, Oxford, Pa., and Eustathios Vassiliou, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 19, 1969, Ser. No. 886,619
Int. Cl. B41b *13/00*; **G03g** *19/00*
U.S. Cl. 95—4.5 **10 Claims**



A method and apparatus for magnetic-optical printing employing a light-transparent uniformly magnetized magnetic medium upon which characters to be printed are first imaged magnetically and then delineated by optical masking using ferromagnetic toner, after which the characters are photographically recorded.

3,604,327
CAMERA LIGHT SENSING SYSTEM
Hiroshi Hirata, Sakai, Japan, assignor to Minolta Camera Kabushiki, Kaisha, Osaka, Japan
Filed June 11, 1969, Ser. No. 832,236
Claims priority, application Japan, June 18, 1968, 42030/68
Int. Cl. G03b *19/04, 19/18*
U.S. Cl. 95—10 C **11 Claims**



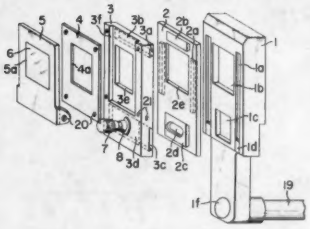
A mechanism for automatically adjusting the sensitivity of a camera light measuring system in accordance with the sensitivity of film in a magazine which is provided with a front sensitivity index defining shoulder includes, a variable light attenuator positioned ahead of a photocell, and a magazine compartment with a front wall. A sensing finger projects through the front wall and is spring urged to advance into engagement with the index and controls the light attenuator. A spring loaded return member urges the finger to a retracted position and includes a plunger projecting into the magazine compartment to be pushed by the inserted magazine to advance the return member and actuate the sensing and control operation and thereby adjust the light attenuator in accordance with the film sensitivity.

3,604,328

SLIDE COPYING DEVICE

Sadao Nakagawa, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sept. 19, 1969, Ser. No. 859,398
Claims priority, application Japan, Sept. 28, 1968, 43/84586
Int. Cl. G03b 29/00
U.S. Cl. 95—12 1 Claim



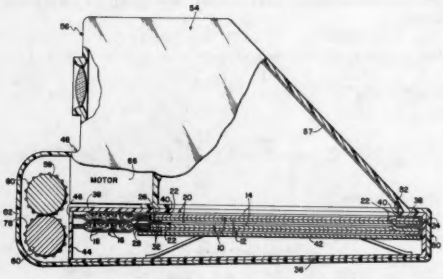
A slide copying device is provided which is capable of moving in both horizontal and vertical directions to allow trimming of a slide both horizontally and vertically. The device employs a single dual purpose clamp handle, which also is used as the handle for the trimming operations.

3,604,329

PHOTOGRAPHIC APPARATUS AND PROCESS FOR CONTROLLING THE DEVELOPMENT OF INDIVIDUAL FILM UNITS AS A FUNCTION OF TEMPERATURE

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 20, 1969, Ser. No. 878,337
Int. Cl. G03b 17/50
U.S. Cl. 95—13 10 Claims



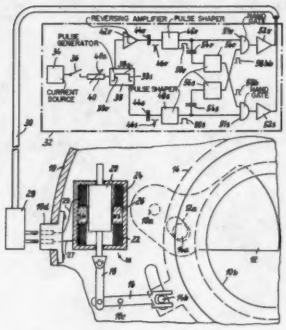
A camera and a photographic process performed therein in which a viscous photographic processing liquid is distributed in a thin layer between an exposed photosensitive element and another element by moving the elements in superposition through a convergent passage between a pair of juxtaposed pressure-applying members biased toward one another by a substantially constant force. The viscosity of the liquid varies inversely with temperature and the speed of movement of the elements is varied in direct relation to the ambient temperature to insure uniform liquid distribution despite temperature changes. The thickness of the layer of liquid can also be maintained constant despite changes in temperature and viscosity by varying the pressure exerted on the elements by the pressure-applying members, and the camera includes structure for varying the pressure exerted by the pressure-applying members as a function of temperature.

3,604,330

MAGNETICALLY DRIVEN PHOTOGRAPHIC SHUTTER WITH BRAKING

Paul Fahlenberg, Baierbrunn, and Walter Ruppelt, Munich, both of, Germany, assignors to Compur-Werk Gesellschaft mit beschrankter Haftung & Co., Munich, Germany

Filed Sept. 4, 1968, Ser. No. 757,362
Claims priority, application Germany, Sept. 19, 1967, P 15 97 154.7
Int. Cl. G03b 9/62
U.S. Cl. 95—53 E 5 Claims



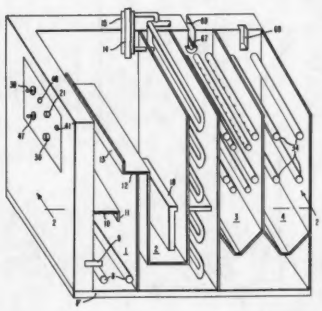
A photographic camera shutter arrangement includes first and second magnetic windings which respectively control the opening and closing movements of the shutter blades. The windings are pulse-energized, the interval between the energization of the first winding by a first control pulse and of the second winding by a second control pulse determining the exposure time of the shutter. A braking pulse applied after a control pulse is applied to a winding other than that to which the control pulse is applied retards movement of the shutter blades in the direction dictated by the control pulse so that "-bouncing" or rebounding of the shutter blades is reduced.

3,604,331

MACHINE FOR DEVELOPING RESIST IMAGES

John Barron Carberry, Parlin; Abraham Bernard Cohen, Springfield, and Robert Bernard Heiart, Middletown, all of, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 26, 1967, Ser. No. 656,106
Int. Cl. G03d 3/06
U.S. Cl. 95—89 R 2 Claims



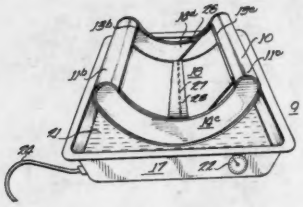
A machine for developing resist images having an initial spray chamber where an exposed photosensitive element is suspended, sprays in said chamber adapted to apply developer solution to said element, a final spray chamber

where the developed element is suspended, and sprays in said final spray chamber adapted to apply a washing solution to the developed element. The machine has a mechanism for recycling the developer solution and metering device for supplying the washing solution. The machine is useful for developing and washing exposed photopolymerizable plates, e.g., those used for printed circuits.

3,604,332
PHOTOGRAPHIC MATERIAL PROCESSING APPARATUS

Robert W. Mitchell, 707 Myrtle Rd., Saint Joseph, Mich., assignor to Heath Co., Benton Harbor, Mich.

Filed Nov. 29, 1968, Ser. No. 805,390
Int. Cl. G03d *13/04*
U.S. Cl. 95—95 **23 Claims**

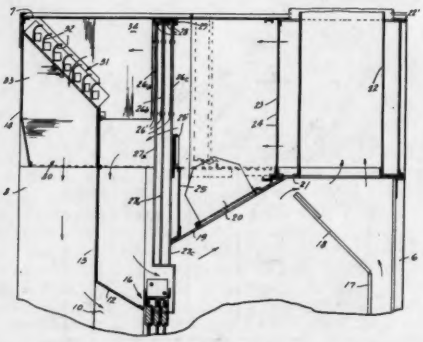


Processing apparatus including a vessel with an arcuate bottom for use in processing sensitized material such as film or photographic paper, the vessel having uniquely curved walls which, when the vessel is agitated, impart to the liquid within the vessel flow patterns particularly effective for the above purpose, the vessel also possessing other unique features which facilitate handling and the pouring of liquids from the vessel and temperature control of chemicals within the tray, and insure more complete chemical contact while conserving the chemicals used, thereby making the vessel particularly useful in a multistep process such as color print processing.

3,604,333
FUME HOOD

Laurence N. Nelson, Onsted, Mich., assignor to Kewaunee Scientific Equipment Corporation, Adrian, Mich.

Filed Nov. 5, 1969, Ser. No. 874,290
Int. Cl. F23j *11/02*
U.S. Cl. 98—115 LH **12 Claims**

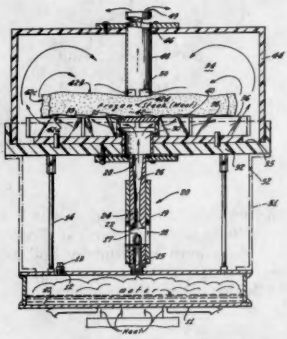


A fume hood structure employing laterally slidable closure means for the access opening thereof, and utilizing an auxiliary air flow through such closure means when the latter is in an open position, in which the amount of such auxiliary air flow is controlled by lateral movement of such closure means, means being provided for directing such air to adjacent the opening in such closure means.

3,604,334
APPARATUS AND METHOD FOR THAWING FROZEN FOOD

Earle W. Ballentine, 3641 Via Polomino, Palos Verdes Estates, Calif.

Filed May 26, 1966, Ser. No. 553,065
Int. Cl. A23l *1/00*
U.S. Cl. 99—234 **23 Claims**

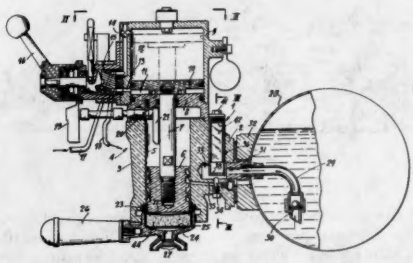


A device for thawing and heating frozen food, having a chamber with means for supporting frozen food. A mixture of hot gases and water vapor is forced in turbulent flow over the frozen food.

3,604,335
DEVICE FOR REGULATING THE TEMPERATURE OF THE INFUSION WATER IN A MACHINE FOR PREPARING COFFEE AND SIMILAR INFUSIONS

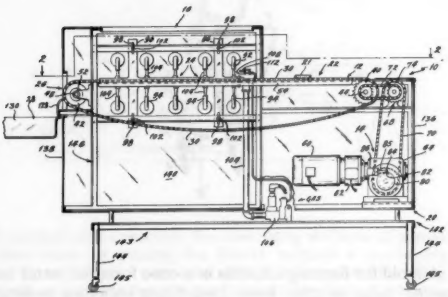
Jacques-Daniel Lafitte, 136 avenue d'Argenteuil, Asnieres, France

Filed Mar. 10, 1970, Ser. No. 18,044
Claims priority, application France, Nov. 6, 1969, 69.38232
Int. Cl. A47j *31/24*
U.S. Cl. 99—302 P **7 Claims**



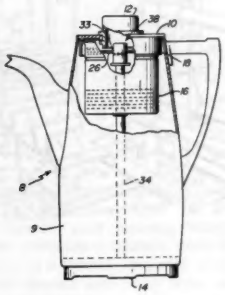
Device for regulating the temperature of the infusion water in a machine for preparing coffee and similar infusions comprising a tubular body containing a cylinder in which a piston defines two chambers for alternative communication with an inlet and a discharge cold water pipe, the tubular body further comprising a cavity for holding hot infusion water kept in communication with a plunger tube partly interned in a boiler for providing hot water under pressure and with at least one duct made in the tubular body to emerge in the infuser piston cylinder.

3,604,336
COOKING DEVICE AND THE LIKE
Donald E. Straub, St. Louis; Henry F. Reitz, St. Louis; Albert A. Yanko, St. Louis, and George B. Hoffmann, Lemay, all of, Mo., assignors to Schrybs Investment Company, Incorporated, St. Louis, Mo.
Filed Sept. 16, 1968, Ser. No. 762,277
Int. Cl. A47j 27/62
U.S. Cl. 99—327 14 Claims



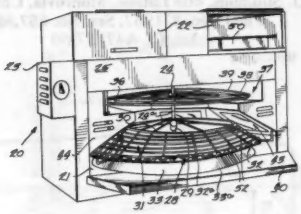
A device for quickly and uniformly cooking food products and especially meat patties including those in an initially frozen state without substantial loss of the flavor or juices of the products, said device having opposed burners positioned and oriented to simultaneously apply flame against opposite sides of the products or patties so as to cook them generally from their centers outwardly to their edges, and means for supporting and positioning the products between the opposed burners for a predetermined time to cook the products to a desired final edible condition.

3,604,337
VALVE FITTED COFFEE PERCOLATOR
James M. Rago, 12604 S. Michigan Avenue, Chicago, Ill.
Filed June 15, 1970, Ser. No. 46,254
Int. Cl. A47j 31/04
U.S. Cl. 99—312 6 Claims



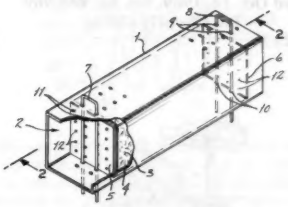
A percolator coffee pot having a tube through which percolating liquid passes for discharge through the open top, and a valve cap freely resting on the top of said tube. The valve cap seals the open top of the tube in closed position, and the valve cap undergoes limited movement under urgings of percolating liquid to bring spray discharge means in the wall of the valve cap into communication with the percolating liquid moving through the top of the tube.

3,604,338
ELECTRIC BROILER FOR COOKING FOOD
Armin Fiedler, Chicago, Ill., assignor to Tastee Freez Industries, Inc., Chicago, Ill.
Filed Apr. 11, 1969, Ser. No. 815,337
Int. Cl. A47j 37/06
U.S. Cl. 99—339 5 Claims



Electric broiler apparatus for cooking food including a housing having an open front portion. A shaft is vertically mounted for rotational movement in the housing, and a cooking rack having an inclined cooking area is secured to said shaft for rotational movement therewith. A toasting rack is also secured to the shaft for rotational movement therewith and is disposed above the cooking rack. A heat shield of conelike configuration is secured to said shaft and is disposed beneath the cooking rack. The cooking and toasting racks and the heat shield project slightly from the front portion of the broiler apparatus for access by the operator. Heat sources are located in the housing above and below the cooking rack and above the toasting rack and an adjustable drive motor is mounted in the housing and is mechanically connected to said shaft for rotating the same.

3,604,339
APPARATUS FOR MAKING FORMED COOKED MEAT
Nicholas R. Beck, and Paul M. Denk, both of University City, Mo., assignors to Food Masters, Inc., University City, Mo.
Filed May 24, 1968, Ser. No. 731,832
Int. Cl. A47j 27/20
U.S. Cl. 99—349 6 Claims

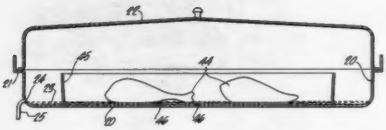


In an apparatus for making formed cooked meat rolls, loaves, or the like, a tubular member, being cylindrical or multisided, is lined with a thermal sensitive and heat shrinkable film, with the raw meat to be formed and cooked being inserted and compacted within said tubular member and liner. Closure members, such as end plates, are applied proximate the ends of the tubular member and contact the ends of the meat disposed therein so as to provide for the formation of the meat into the desired roll or loaf form, and various connecting means, such as threaded engagement, is provided for retaining the end plates positioned against the formed meat.

During the cooking process in which the tubular member combination and retained meat are exposed to a cooking medium, the heat shrinkable film closely adheres to the surface of the meat thereby preventing the natural juices of the meat from accumulating proximate this surface, and thereby forcing some juices, if any need to be discharged, to traverse

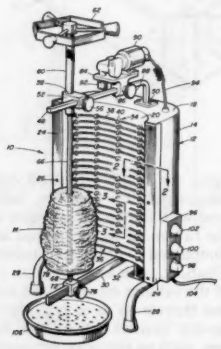
longitudinally of the formed meat and seep past an end plate. The cooked and formed meat and the tightly conforming liner are then easily removed from the tubular member following the cooking process.

3,604,340
PRECOOKING APPARATUS
Stanley J. Simmons, 408 Latone, Monrovia, Calif.
Filed Dec. 4, 1967, Ser. No. 687,881
Int. Cl. A47j *37/00*
U.S. Cl. 99—404 **5 Claims**



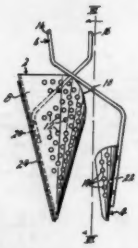
An apparatus for precooking chicken or other food products which are to be reheated by frying prior to consumption. The product is provided with a coating or breading, and is placed in a perforated tray to be conveyed through a tank holding a shallow bath of heated cooking oil. The depth of the bath is controlled so only the lowermost portion of the product makes direct contact with oil, and so the tray or pan has no tendency to float in the bath while being conveyed through the tank. Alternatively, the perforated tray is placed in a solid pan which carries a very shallow layer of cooking oil, and the solid pan is conveyed through the tank. The product is tenderized and the coating is converted to a protective shield by the hot, humid air above the oil and surrounding the product as it is conveyed through the bath. The precooked product and tray are removed from the bath and permitted to drain and cool prior to packaging.

3,604,341
VERTICAL ROTISSERIE
James H. Coroneos, Frederick and Thistle Rds., Baltimore, Md.
Filed Oct. 16, 1969, Ser. No. 866,969
Int. Cl. A47j *37/04*
U.S. Cl. 99—421 V **4 Claims**



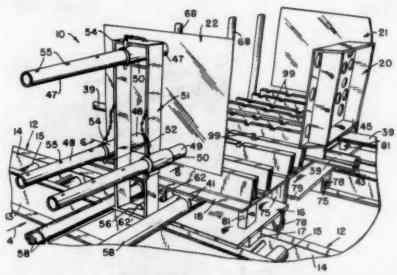
A vertical rotisserie is provided which consists of an electric barbecue arrangement having an arcuate heating element in the general focus of which a rotatable spit is mounted. The axis is vertical so as to protect the heating element from drippings which instead are collected in a drip pan under the end of the spit.

3,604,342
CONE MOLD FOR TORTILLAS
Jess L. Harding, 1834 South 13th Street, Kansas City, Kans.
Filed Feb. 18, 1969, Ser. No. 800,198
Int. Cl. A47j *43/18*
U.S. Cl. 99—426 **7 Claims**



A mold for forming a tortilla in a cone form for better containing tacos or other loose food filling including moisture, said mold consisting of a hollow, perforated metallic conical body about which a tortilla patty may be wrapped in cone form so as to close the cone form at its apex and with opposed edges thereof overlapping, a perforated, semicylindrical clamp adapted to press the overlapping portions of said tortilla patty to hold it in place on the cone body, and means for suspending said mold in a vessel of hot cooking oil to cook said patty, said mold body being compressible to facilitate release of the cooked patty from the mold body.

3,604,343
SHEET STACKING MACHINE
Truman Thornfelt, 445 Ledyard, Detroit, Mich.
Filed Apr. 7, 1969, Ser. No. 813,857
Int. Cl. B65b *13/04*
U.S. Cl. 100—7 **19 Claims**

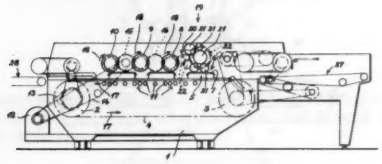


A horizontally flat base reciprocates under hydraulic power between sheet stacking and banding positions, the base supporting a tiltable plate onto which metal sheets are dropped successively from a shear, gravitating into rear engagement with gauging posts. A hydraulically operable, upright front gauge plate moves into engagement with the front of the stack to true the latter; and opposed hydraulically operable gauge plates act similarly upon the stack ends. Ways on the tiltable plate receive flexible steel banding strips beneath the gauged stack when the base has shifted it forwardly from stacking position to a position at which a banding machine operates.

3,604,344
METHOD OF SMOOTHING SURFACES OF BLANKS OF FIBER MASS AND A SMOOTHING MACHINE TO CARRY THE METHOD INTO EFFECT

Preben Einar Roar Orstam, 14, Hostrupsvej, Copenhagen, Denmark

Filed Sept. 16, 1969, Ser. No. 858,299
Claims priority, application Denmark, Sept. 23, 1968, 4567/1968
Int. Cl. B30b *13/00, 15/34*
U.S. Cl. 100—35 **10 Claims**

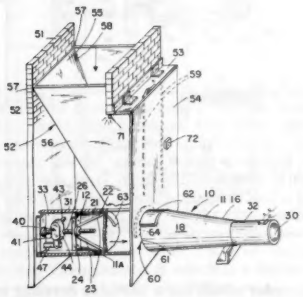


A method and a machine for smoothing surfaces of blanks of fiber mass by passing the blanks beneath a smoothing roller by means of a conveyor while keeping the smoothing roller at an elevated temperature and driving the roller with a peripheral speed which is different from the advancing speed of the conveyor.

3,604,345
WASTE COMPACTING DEVICE

Daniel Q. Boje, Staten Island, N.Y., assignor to Compactor Corporation, Brooklyn, N.Y.

Continuation of application Ser. No. 588,050, Oct. 20, 1966. This application July 18, 1969, Ser. No. 842,892
Int. Cl. B30b *15/14*
U.S. Cl. 100—48 **13 Claims**



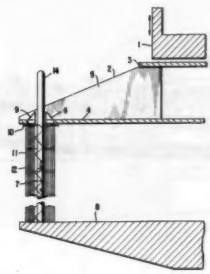
A waste compacting assembly comprising an elongated circular housing, a movable compactor of annular shape slidably mounted therein, said housing being adapted to receive waste to be compacted therein, said housing being partially in the shape of a funnel, and said compactor being forcibly reciprocable toward and away from said funnel to compact waste into said funnel.

3,604,346
DYEING APPARATUS AND PROCESS

Christian Caire, Tignieu, France, assignor to Moulinage et Retorderie de Chavanoz, Chavanoz, France

Filed Mar. 28, 1969, Ser. No. 811,451
Int. Cl. B30b *15/02*
U.S. Cl. 100—221 **6 Claims**

An improved apparatus for the pressing of piles of textile windings mounted on compressible supports, the supports themselves being mounted on spindles affixed to the material support of a dyeing machine, the improved apparatus including a pressing member and a pressure distributing member composed of two metallic plates, upper and lower respectively, connected by rigid elements, the lower plate being provided with perforations, over each of which is provided a guiding element. Such apparatus can additionally contain

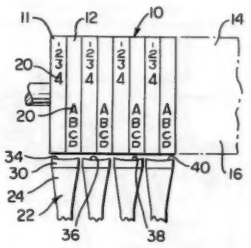


cupping rings on top of the piles of windings and a device to lock each pile in a compressed state. By utilizing such apparatus a process is provided whereby stacks or piles of textile windings are uniformly compressed under the same pressure so that irregular circulation of the dyeing bath through the windings is minimized and a more even dyeing of the textile windings results.

3,604,347
PRINT HAMMER IMPACT TIP

Ronald E. Muterspaw, Fairborn, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Feb. 11, 1969, Ser. No. 798,312
Int. Cl. B41j *9/00*
U.S. Cl. 101—93 **12 Claims**



A centrally supported print hammer having an impact tip adaptable for striking type characters in more than one column on a rotating typedrum, the tip providing a concave surface curvature for engaging with one edge or a portion of a character prior to engaging with another edge or the remaining portion of the same character. The tip is formed with the surface curvature in a direction axially along the drum; that is, the surface is concave in a direction normal to the curvature of the drum, whereupon, at the moment of impact, the uneven force resulting from the tip's striking a character offset from the centralized driving force is compensated by the tip curvature to provide uniform print density.

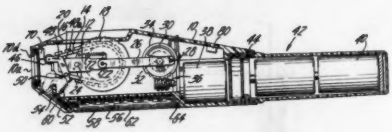
3,604,348
TYPE BAND MARKING DEVICE HAVING ELECTRICALLY OPERABLE ACTUATING MEANS

Howard Price, Kings Point, and David Berend, New York, both of, N.Y., assignors to International Patents & Development Corp., Kings Point, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,680
Int. Cl. B41j *1/20;* **B41f** *17/00*
U.S. Cl. 101—108 **5 Claims**

A marking device in which reciprocating motion is applied to a carrier bearing selectable marking indicia. A rotary

member grasps one end of the connecting rod to the reciprocating carrier, when retracting the carrier into its housing. The connecting rod is freely released by the rotary member, when the carrier is brought forward into marking

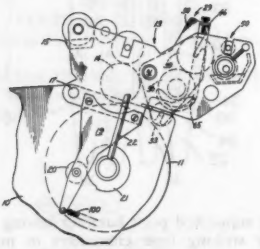


position. Upon release of the connecting rod from the rotary member, a spring, tensioned during retraction of the carrier, forces the carrier forward and against the surfact to be marked.

3,604,349
TWO-SYSTEM MOISTURE APPLICATOR FOR A LITHOGRAPHIC PRESS

Arthur W. Sejeck, Kirkland, and Ronald J. Garcowski, Cleveland, both of, Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Dec. 24, 1968, Ser. No. 786,651
Int. Cl. B41f *7/40*
U.S. Cl. 101—148 **6 Claims**



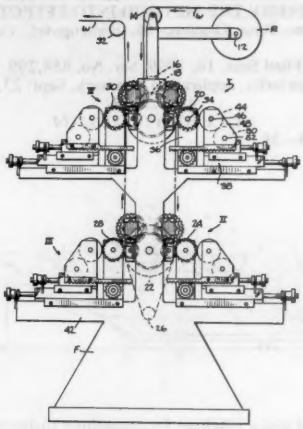
A two-system moisture applicator for masters on a lithographic press. The first system rotates to contact the master, and is retracted by lowering its pivot center to cause a cam and follower to move the system away. The other system is conventional.

3,604,350
FLEXOGRAPHIC PRESSES WITH INTERRUPTER AND CYLINDER REGISTER MECHANISMS

Lawrence Rosenstadt, Rye, N.Y., assignor to Lee Machinery Corporation, New York, N.Y.

Filed Apr. 23, 1969, Ser. No. 818,647
Int. Cl. B41f *5/16, 31/30*
U.S. Cl. 101—181 **8 Claims**

A flexographic press having a plurality of printing stations with each station having an associated impression cylinder, a printing plate cylinder mounted for individual movement back and forth relative to its impression cylinder, and an ink fountain roller mounted for individual movement back and

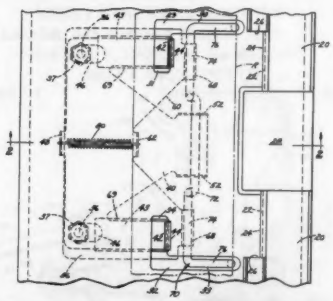


forth relative to its printing plate cylinder, and means for correcting the web registration between stations.

3,604,351
AUTOMATIC RIBBON LIFTING AND LOWERING MECHANISM IN IDENTIFICATION PLATE PRINTERS

Donald T. Mahoney, Willoughby, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Continuation-in-part of application Ser. No. 660,114, Aug. 11, 1967, now abandoned. This application Oct. 17, 1969, Ser. No. 868,977
Int. Cl. B41f *3/04, 1/44;* **B41k** *1/48*
U.S. Cl. 101—274 **6 Claims**



A data recorder which has a movable carriage mounted on a bed includes a roller platen supported on the carriage adapted to imprint a form from an embossed card when the carriage is moved across the bed. A continuous web of carbon paper ribbon is positioned intermediate the embossed card and the form to be imprinted, and a ribbon lifting mechanism is provided for lifting the ribbon sufficiently above the bed to facilitate placement of the card thereunder and, subsequently, lowering the ribbon preparatory to receiving a form to be imprinted and before the carriage and the roller platen are actuated for printing.

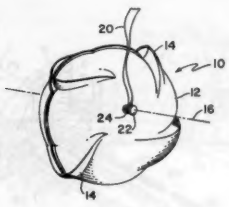
3,604,352
SPHERICAL FREE FALL APPARATUS

Thomas E. Bench, Richmond, Ind., assignor to Avco Corporation, Richmond, Ind.

Filed Oct. 27, 1969, Ser. No. 869,479
Int. Cl. F42b *25/16*
U.S. Cl. 102—4 **7 Claims**

A spherical free fall apparatus is disclosed. The free fall apparatus has airfoils thereon to cause spin of the apparatus

about an axis of rotation, the spin resulting in the apparatus having a glide path, and one or more flexible means attached at the axis of rotation for the purpose of causing the free fall



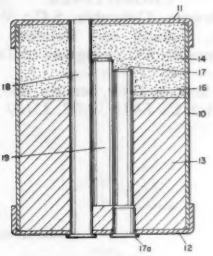
apparatus to precess in its glide path thereby making it possible to control the flight characteristics and ground impact points of the free fall apparatus.

3,604,353

CAST BOOSTER ASSEMBLY

Philip G. Newman, Kenvil, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 24, 1968, Ser. No. 786,667
Int. Cl. F42b *1/00*
U.S. Cl. 102—24 **14 Claims**



The invention provides a booster assembly for a main explosive wherein the booster charge is formed from TNT and PETN and/or RDX and contains less RDX and/or PETN than required in comparably performing conventional booster charges of the cyclotol and pentolite types. The booster charge is a layer of a cast explosive of the group of pentolites, cyclotols and mixtures thereof, and a layer of cast TNT contiguous thereto. On a weight ratio basis, preferred pentolites contain PETN/TNT of from 60/40 to 40/60; and preferred cyclotols contain RDX/TNT of from 75/25 to 50/50, including Composition B which is a 60/40 RDX/TNT containing 1 percent of a microcrystalline wax.

3,604,354

EXPLOSIVE BOOSTER FOR RELATIVELY INSENSITIVE EXPLOSIVES

Robert A. Brown, and Emory E. Toops, Jr., both of Terre Haute, Ind., assignors to Commercial Solvents Corporation, New York, N.Y.

Filed Aug. 14, 1969, Ser. No. 850,259
Int. Cl. C06c *1/00*
U.S. Cl. 102—24 R **4 Claims**

An explosive booster for detonating relatively insensitive blasting charges, such as oiled ammonium nitrate and aluminized ammonium nitrate, the booster including a core of detonating cord-sensitive material, such as detonating cord, pentolite and pentaerythritol tetranitrate (PETN), and a sheath of less sensitive explosive material. The sheath contains on a weight basis:

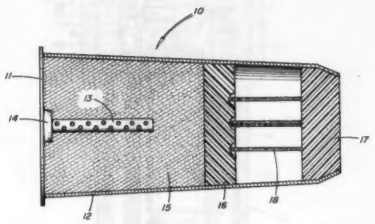
a. 45 percent to 75 percent RDX;
b. 0.6 percent to 3.1 percent Wax;
c. 8.6 percent to 70 percent TNT; and
d. 0.9 percent to 10 percent Aluminum.

3,604,355

PROPELLANT-LOADED CARTRIDGE

William D. Greenlees, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 5, 1969, Ser. No. 796,671
Int. Cl. F42b *5/20*
U.S. Cl. 102—39 **4 Claims**



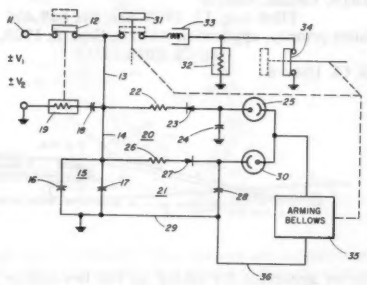
A cartridge having a primer disposed at one end therein and assembled by loading with a predetermined amount of charge and packing the charge in place about the primer with a resilient wad secured within the cartridge in predetermined spaced relationship with a closure plug at the other end of the cartridge.

3,604,356

VARIABLE TIME ORDNANCE FUZE CIRCUIT

Charles A. Browning, Jr., Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 6, 1969, Ser. No. 804,865
Int. Cl. F42c *11/00, 15/40, 15/00*
U.S. Cl. 102—70.2 R **5 Claims**



An ordnance fuze circuit having an energy storage device for storing an applied energy signal. A plurality of unidirectionally conducting RC circuits connected to the energy storage device provide time delays corresponding to the magnitude and polarity of the applied signal in firing gas diodes to actuate switches which provide for discharge of the stored energy through a detonator to explode the ordnance device. A switch connected between the energy storage device and the predetermined energy signal source prevents discharge of the energy storage device back to the energy source.

3,604,357

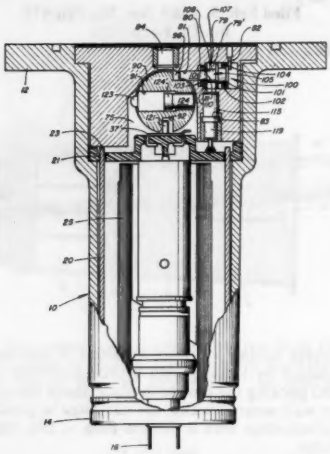
DISCRIMINATING PROXIMITY ORDNANCE FUZE

Cecil L. Duncan, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed May 2, 1969, Ser. No. 821,174
Int. Cl. F42c *1/14, 13/00, 15/40*
U.S. Cl. 102—81 **10 Claims**

A mechanical fuze for aerial ordnance devices having an extendable probe mounting on its nose and an actuator non-

responsive to the presence of foliage and responsive only to target impact. A safety and arming mechanism is provided having a double-locked rotor which rotates to an armed position only after an electrical signal has been delivered to the fuze and after the probe has been extended. A clamp is provided which locks and rigidifies the probe in its extended position.



3,604,358
MAINTENANCE APPARATUS

Franz Plasser, and Josef Theurer, both of Johannesgasse 3 1010, Vienna, Austria

Filed Aug. 12, 1969, Ser. No. 849,406
Claims priority, application Austria, Sept. 5, 1968, A8659/68
Int. Cl. E01b *29/10*
U.S. Cl. 104—6 **19 Claims**

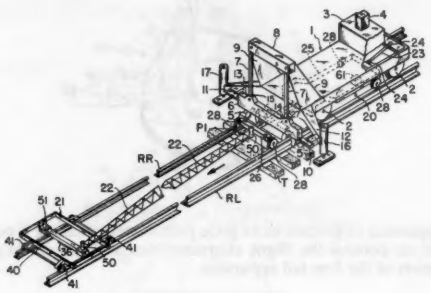
In an apparatus for taking up old ties and/or laying new ties, an elongated conveyor is supported between a tie transport car and a device for moving the ties from a first position extending in the direction of track elongation, in which they are transported on the conveyor, and a second position transverse thereto. The unit is movable partly on the ballast and partly on the track rails.

3,604,359
APPARATUS FOR CORRECTING RAILROAD TRACK

Richard B. Doorley, Brentwood Borough, and Paul S. Settle, Jr., Fox Chapel, both of, Pa., assignors to Railway Maintenance Corporation, Pittsburgh, Pa.

Filed Apr. 4, 1969, Ser. No. 813,532
Int. Cl. E01b *33/02*
U.S. Cl. 104—8 **15 Claims**

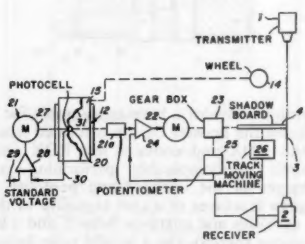
Apparatus for use in correcting the position of railroad track including an elongated vehicle carrying means responsive to a variation in electric current, at least one elongated rigid member extending forwardly from the vehicle and pivotally supported thereon and a second vehicle pivotally supporting the other end of the member for movement along the track. At least one variable resistor attached between the member and the elongated vehicle and connected in a bridge circuit with the means responsive to current variation so that angular displacement of the elongated vehicle and the member in at least one plane from a preset relationship varies the resistance of the variable resistor effecting a response by the means responsive to current variation.



3,604,360
CHORD LINER

John Kenneth Stewart, Columbia, S.C.; William J. Tyler, Valois, Quebec, Canada, and Helmuth Rolf Erich von Beckmann, Columbia, S.C., assignors to Tamper Inc., West Columbia, S.C.

Filed Sept. 4, 1969, Ser. No. 855,102
Int. Cl. E01b *32/02, 35/10*
U.S. Cl. 104—8 **3 Claims**



Apparatus for aligning railroad track providing automatic alignment to a visual representation appearing on a recording medium. Generally the invention provides apparatus comprising means mounting said apparatus for movement along a length of track, means for mounting a recording medium carrying a representation of the desired alignment condition of the length of track, means for following said representation, and means responsive to said following means for moving the track at a point in said length to correct misaLignment of the track.

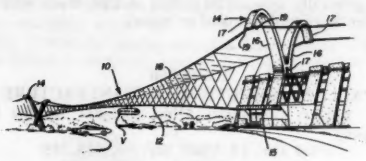
3,604,361
AERIAL GUIDEWAY SYSTEM

Arney J. Harbert, Denner, and Robert M. Towner, Boulder, both of, Colo., assignors to Aerial Transit Systems, Inc., Los Angeles, Calif.

Filed Jan. 21, 1969, Ser. No. 798,248
Int. Cl. B61b *3/00;* **E01b** *25/22*
U.S. Cl. 104—123 **23 Claims**

A vehicle transport system has elevated single or double tracks which are suspended by cable and transverse

suspender elements in the form of an inverted delta from and between spaced supporting towers. In order to establish uniform flexibility in the track over its entire span, notwithstanding variations in temperature and in static and



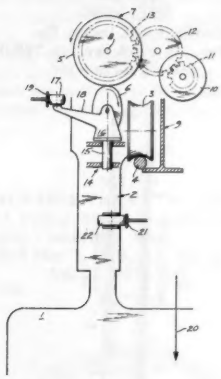
dynamic loading, the track structure is suspended indirectly from the supporting towers by suspension elements both along straight and curved sections, and a unique combination of takeup and suspension members is incorporated in the system.

3,604,362

MONORAIL INSTALLATION

Pierre Goirand, Grenoble, France, assignor to Societe Generale de Constructions Electriques et Mecaniques (Alsthom), Grenoble, France

Filed Jan. 13, 1970, Ser. No. 2,487
Claims priority, application France, Oct. 14, 1969, 69.35946
Int. Cl. B61b *13/12*
U.S. Cl. 104—166 **8 Claims**



In the monorail installation disclosed herein the vehicle suspended from the rail is driven by a swivel roller provided on an overhead truck and means comprising a controlled surface moving in a closed path and affording a lower generatrix parallel to the direction of the travel of the vehicle on the rail and against which bears the upper generatrix of the swivel roller. The controlled surface has imparted to it a continuous movement in a direction transverse with respect to the direction of the rail, and the center of gravity of the vehicle and the swivel roller are located laterally on opposite sides of the rail so that the swivel roller will automatically bear against the controlled surface with a given pressure.

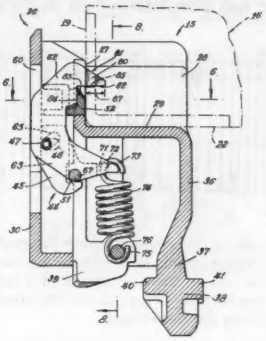
3,604,363

CONTAINER SECURING MEANS FOR TRANSPORT CARRIER WITH AUTOMATIC LATCH TO ACCOMMODATE VARIOUS CLEARANCES WITH BOTTOM CONTAINER FITTINGS

Edward Payson Smith, Winnetka, Ill., assignor to Illinois Railway Equipment Company, Chicago, Ill.

Filed June 1, 1970, Ser. No. 41,944
Int. Cl. B61d *45/00*
U.S. Cl. 105—366 D **10 Claims**

The spring-biased latches on a transport carrier for automatically engaging and disengaging bottom corner container fittings are bodily movable to maintain the same latching engagement within limits for various clearances between the



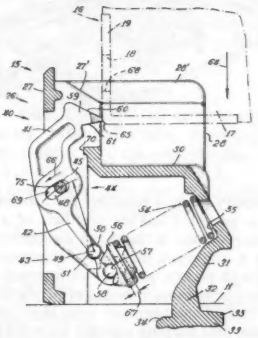
container fittings and the housings secured to the transport carrier on which the latches are mounted.

3,604,364

SINGLE SPRING DEVICE FOR AUTOMATICALLY LATCHING AND UNLATCHING A CONTAINER TO AND FROM A RAILWAY CAR OR THE LIKE

Theodore J. Sweger, Naperville, Ill., assignor to Illinois Railway Equipment Company, Chicago, Ill.

Filed Dec. 19, 1969, Ser. No. 886,489
Int. Cl. B61d *45/00*
U.S. Cl. 105—366 C **14 Claims**



The fittings at the corners of a container are automatically latched to a railway car when it is lowered thereon and unlatched therefrom when the container is lifted from transport position. Each fitting is received in a housing on the car on which a bellcrank latch is mounted to pivot about a pair of spaced axes under the biasing action of a coil compression spring reacting between the housing and the distal end of one arm of the latch. The distal end of the other arm of the latch has latching engagement with the respective container fitting. The housings are slidable along slots extending lengthwise along opposite sides of the car and can be swung to retracted positions on trunnions extending below the floor or deck of the car. The trunnions are located in spaced relation to the latches to cause them to maintain latching engagement with the container on upward movement of it during transport. The retracted housings are arranged to be bypassed by other housings slidable along the slots.

3,604,365

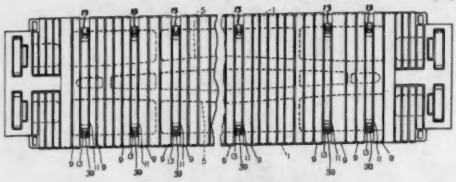
LADING STRAP ANCHOR WITH FLOORBOARD SUPPORT

Raymond H. Wall, East St. Louis, Ill., assignor to General Steel Industries, Inc., St. Louis, Mo.

Filed Apr. 3, 1969, Ser. No. 813,084
Int. Cl. B61d *45/00*; **B60p** *7/08*
U.S. Cl. 105—369 A **2 Claims**

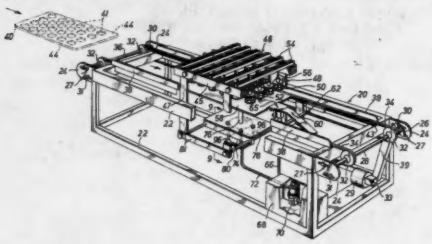
A combined lading strap anchor and short floorboard support device for railway flatcars comprising a plate offset

transversely of its thickness intermediate its ends whereby its bottom surface at one end and its top surface at the other end are substantially coplanar, a barlike element extending transversely of said plate intermediate its ends and spaced



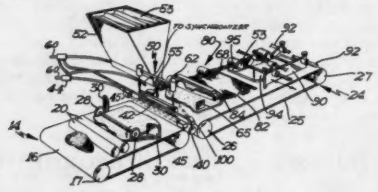
vertically thereabove, means supporting the ends of said barlike element from said plate, said bottom surface of said plate being adapted to rest on the top surface of a railway car side sill, and said top surface being adapted to underlie the end portion of a railway car floorboard.

3,604,366
MACHINE FOR FORMING BAKERY PRODUCTS
Earl K. Jarrett, Corpus Christi, Tex., assignor to Clayton Specialties, Inc., Corpus Christi, Tex.
Filed Oct. 30, 1968, Ser. No. 771,744
Int. Cl. A21c *11/12*
U.S. Cl. 107—68 **30 Claims**



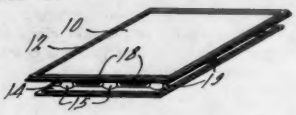
In one exemplary form, a machine for forming pan-carried dough pieces to produce bakery products of a desired form and shape. The machine includes an elongated frame structure mounting a conveyor means for transporting the pans carrying the dough pieces, an array of forming dies mounted above the conveyor means, a means of lifting the pan-carried dough pieces out of engagement with the conveyor means and into forming and shaping contact with the array of overhead forming dies and a trigger assembly for actuating the lifting means when the pan-carried dough pieces are properly aligned beneath the array of forming dies.

3,604,367
APPARATUS FOR MAKING A FOOD PRODUCT
Frances B. Arries, P.O. Box 63, Pengilly, Minn.
Filed May 12, 1969, Ser. No. 823,842
Int. Cl. A21c *11/10*
U.S. Cl. 107—69 **9 Claims**



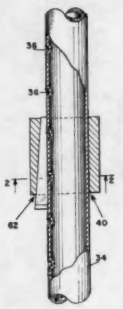
A method and apparatus for making a bread type food product which, in its finished form, will have a hole therein. The method includes the step of rolling dough to a flattened form and thereafter rolling the flattened dough on a tubular member with the dough overlapping the tubular member at one end such that it may be sealed to provide a closed extremity to the resultant product. The machine for performing the method includes a structure for placing tubes on the flattened dough and thereafter engaging the dough and causing it to roll upon itself and the tube in a spiral manner to provide a generally cylindrical rolled dough mass which will thereafter be suitably cooked or baked.

3,604,368
PALLET AND METHOD OF MANUFACTURE
Jack E. Baxter, Cincinnati, Ohio, assignor to The Baxter Company
Filed Apr. 14, 1969, Ser. No. 815,755
Int. Cl. B65d *19/18*
U.S. Cl. 108—57 **3 Claims**



A four-way entry pallet is vacuum formed from two spaced parallel preheated sheets of thermoplastic comprising a top sheet which is flat except for a rim flange and a bottom sheet formed over a plurality of embossing and fusing posts to define supporting pillars integral with the bottom sheet and fused to the top sheet.

3,604,369
SHELVING
Louis Maslow, Huntsville Road, Dallas, Pa.
Filed Feb. 10, 1969, Ser. No. 798,048
Int. Cl. A47b *9/08*
U.S. Cl. 108—144 **12 Claims**

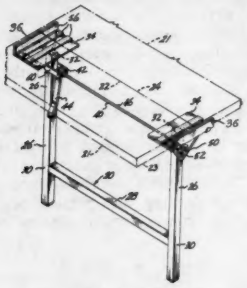


Adjustable shelving comprising a flat shelf member having corner supports secured thereto at each corner of said shelf member, said corner supports being adapted to receive and securely hold corner posts provided with graduate indents spaced at predetermined increments along their vertical dimension, said corner supports being provided with locking post supports for holding said corner supports and corner posts in secured relation, said post supports each further comprising a unitary collar associated with means for locking the collar to said post. The spacing of the shelving is adjusted by varying the position of the locking post supports along the height of the corner posts.

3,604,370
SUPPORT STRUCTURE FOR CONVERTIBLE TABLES
John C. Sherwood, 4932 La Crescenta Ave., La Crescenta, Calif.
Filed Feb. 7, 1969, Ser. No. 797,608
Int. Cl. A47b *5/00*
U.S. Cl. 108—153 **2 Claims**

A removable clamp-on dual leg unit is provided to be used with others to firmly support one or more table tops. The

clamping is effected by drawing together paired angles whose respective flanges contact the opposite table top edges and their adjacent undersurfaces, or like formed cutouts in under structures of table tops. Final movement of the clamping angles, each supported on a respective leg top, occurs as the leg tops are pulled together upon torque being hand applied to a lever. The lever turns an eccentric mechanism that is eccentrically rotatably supported on one leg top and is in turn rotatably connected to the end of a cross pull and brace or tie rod which is threadably secured to the opposite leg top.



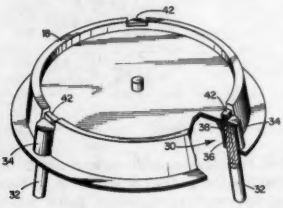
Preceding the final eccentric take up, in reference to table of different widths, starting adjustments are undertaken at the outset to substantially match the particular width of a table top or places of securement thereto, by adjusting the respective threaded connection of the pull, brace, or tie rod to the opposite leg top. The latter adjustment, made only once in reference to a table top of a specific width, is only limited by the thread length and by the deflectability or bending limitations of the upper leg portions as the bottom portions of the legs remain secured together, preferably at a fixed distance apart.

3,604,371

STACKABLE TRANSIT PLATFORM

Ralph Cavalucci, Boston, Mass., assignor to American Science and Engineering, Cambridge, Mass.

Filed May 7, 1970, Ser. No. 35,467
Int. Cl. A47b *3/06*
U.S. Cl. 108—156 **8 Claims**



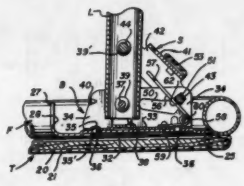
This disclosure relates to transit platforms suited for simplified educational or demonstrative use. The platforms are formed from a pair of dishlike, molded plastic sheets which are secured together in a nested configuration so that their rims are generally concentric. The concentric rims are molded to define a number of downwardly opening sockets which are spaced circumferentially about the platforms and which receive removable legs. The upper surface of the platform has a central upstanding peg which engages the transit. The periphery of the top of the platform is surrounded by a rim which holds the transit in place and which may be marked in degrees. The rim includes a number of circumferentially spaced depressions which are intended to receive projections formed at the underside of other platforms thus facilitating the stacking of the platforms one atop the other.

3,604,372

CONNECTOR FOR FOLDING TABLE LEG

Oscar C. Hewett, Coal Creek Canyon, Colo., and Tim M. Uyeda, South San Gabriel, Calif., assignors to Samsonite Corporation, Denver, Colo.

Filed Sept. 30, 1968, Ser. No. 763,582
Int. Cl. A47b *3/091*
U.S. Cl. 108—160 **2 Claims**



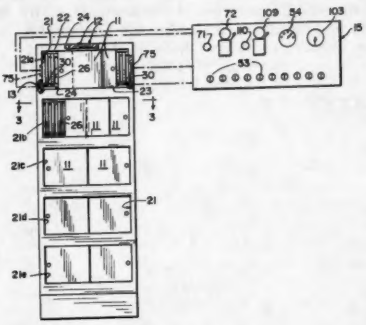
A connector for a folding table leg having a base attached to the frame of a table underneath the top, a bracket secured to the underside of the base and having a table leg pivotally connected thereto and a stabilizing strut having one end pivotally secured to the leg below the bracket connection and the other end having a lock bar slidably carried in a slot in the bracket. The slot in the bracket includes an offset socket whereinto the lock bar wedgingly fits when the table leg is extended, to tightly hold the table leg in extended position. A spring biases the lock bar into the socket, but the lock bar may be removed therefrom by finger pressure against the face of the strut, to cause the table leg to be folded to a retracted position on the underside of the table.

3,604,373

SECURITY STORAGE APPARATUS

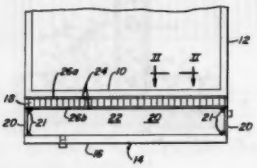
Duane E. Crowley, 3949 Elm Court, Flossmoor, Ill.; Roy M. Hoffman, 60 Judith Lane, Chicago Heights, Ill., and Evan D. Roberts, 818 Elm Street, Flossmoor, Ill.

Filed May 4, 1970, Ser. No. 34,385
Int. Cl. E05g *3/00*
U.S. Cl. 109—38 **18 Claims**



Disclosed herein is a storage enclosure cabinet of magnetic shielding material for storing magnetic tapes, magnetic disks and similar articles; sliding closure doors for sealing accesses in the storage enclosures; restrictors, such as plunger actuated solenoids for limiting operation of the closure doors; actuator means for operating the restrictor means to disengage same from the closures restrictor control apparatus operable to prevent the operation of the restrictor apparatus; magnetic field detector and alarm apparatus coupled with the restrictor and the restrictor control.

3,604,374
COMPOSITE BLAST-ABSORBING STRUCTURE
Harold E. Matson, Peters Township, Washington County, and William J. Riffe, Carnegie Borough, both of, Pa., assignors to United States Steel Corporation
Filed Aug. 18, 1969, Ser. No. 850,851
Int. Cl. F41h *5/04;* **B32b** *3/12*
U.S. Cl. 109—81 **7 Claims**

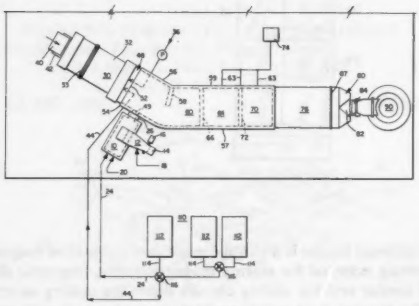


This invention relates to a protective panel for the blast protection of a structure.

The protective panel has an impact member, a honeycomb member disposed opposite the impact member, distendible side members defining with the impact member and the honeycomb member a cavity, and a fluid hermetically sealed in the cavity. The honeycomb member is secured to the panel. The impact member is operable when a localized high-intensity force of an explosion contacts the impact member to transmit the localized high-intensity force of the explosion to the fluid. The fluid is operable to convert the localized high-intensity force to a uniform low-intensity force on the honeycomb member and the side members. The honeycomb member is subjected to accordion-type crushing, and the sidewalls deflect outwardly in bending and fracturing, thus allowing the impact member to contact and deform the honeycomb member and minimally deform the panel.

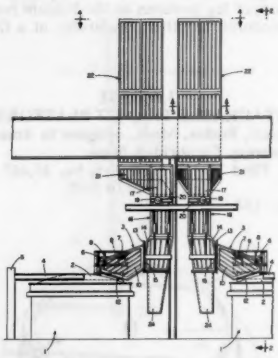
Alternatively, a second honeycomb member or a multiplicity of honeycomb members is substituted for the cavity.

3,604,375
INCINERATION PROCESS AND UNFIRED AFTERBURNER APPARATUS
Robert B. Bruns, Princeton, N.J.; Donald J. Frey, North Canton; Emil J. Huyghebaert, Collinsville, Conn., and Albert B. Mindler, Princeton, N.J., assignors to International Hydronics Corporation, Monmouth, N.J., by said Bruns and said Mindler and Combustion Engineering, Inc., Windsor, Conn., by said Frey and said Huyghebaert
Filed Mar. 31, 1970, Ser. No. 24,087
Int. Cl. F23g *5/06*
U.S. Cl. 110—7 R **36 Claims**



Process for achieving complete and relatively inexpensive combustion of solid, semiliquid, and liquid combustible waste materials, and combinations thereof, having low heat value, by incompletely burning a combination of such materials in a first furnace to produce a combustible gaseous exhaust stream, achieving complete combustion in a second furnace of combustible high heat value waste materials to produce a noncombustible gaseous stream, intimately admixing the two streams in an unfired afterburner, without the addition of heat from an auxiliary heat source, while maintaining a minimum admixture temperature above the temperature required for autoignition of the combustibles in the first stream, whereby the heat produced by combustion of the high heat value waste materials is utilized for the spontaneous ignition and complete combustion of the incompletely burned materials. Liquid wastes of high heat value and of low heat value are separately stored, and are variously blended for feed to the first furnace and the second furnace in accordance with the heat requirements of the system to achieve complete combustion of all wastes being burned. The apparatus particularly adapted to perform the process comprises a pair of furnaces, a refractory-lined afterburner chamber having no auxiliary heat source, duct means interconnecting said afterburner chamber and each of said furnaces, and exhaust means defined by said afterburner for permitting exhaust of the burned gas stream after combustion is completed. The apparatus preferably includes appropriate draft handling, gas cooling, and particle removal means to render the gaseous atmospheric discharge relatively pollution-free.

3,604,376
ELECTRIC FURNACE VENTILATION AND GAS COOLING CLEANING SYSTEM
Henry L. Meyer, Cleveland Heights, and Robert B. Stofko, Kirtland, both of, Ohio, assignors to Sticker Industrial Supply Corporation, Willoughby, Ohio
Filed Dec. 16, 1969, Ser. No. 885,449
Int. Cl. F23j *11/00*
U.S. Cl. 110—184 **3 Claims**



An electric furnace ventilation and gas cooling and cleaning system including a duct system for combusting, cooling and vertically venting dry waste gases from the furnace. There is a lower pivoted cooling duct and an upper fixed cooling duct horizontally and vertically offset to the furnace and the lower pivoted duct. A horizontally disposed duct interconnects the upper fixed duct and lower pivoted duct. A vertically movable duct is located between the furnace and the vertically pivoted duct and the rate of air intake to the vertically movable duct is varied at each end thereof. Each of the ducts is formed of four water-cooled panels joined together at their edges.

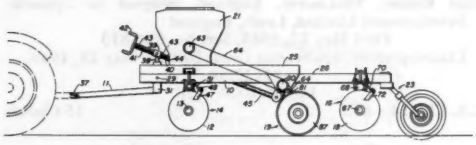
3,604,377
SEEDLING PLANTING TOOL
Merlin B. Smith, P.O. Box 494, West Monroe, La.
Filed Dec. 15, 1969, Ser. No. 884,940
Int. Cl. A01g *23/02*
U.S. Cl. 111—4 **7 Claims**

An upstanding staff including a laterally outwardly projecting footrest above its lower end. The staff is designed to be

forced down into soft ground by foot pressure applied to the foot rest with the undersurface of the foot rest limiting downward penetration of the lower end of the staff into the ground. The lower end of the staff is formed to engage the root end of a seedling disposed horizontally on the ground prior to downward penetration of the staff into the ground,

whereby the staff will carry the seedling root end down into the ground as it penetrates the latter. Also, the lower end of the staff includes a shrouded vertically reciprocal cutting member which may be downwardly projected below the lower end of the staff after penetration of the latter in the ground for cutting the root end of the seedling prior to upward withdrawal of the staff from the ground.

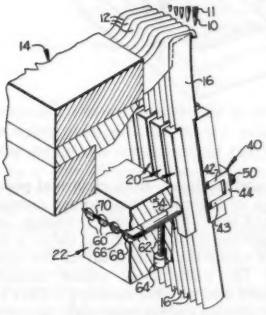
3,604,378
GRASSLAND PLANTER
Wilbur F. McDaniel, Jr., 1704 Acoma St., Ponca City, Okla.
Continuation-in-part of application Ser. No. 804,812, Mar. 6, 1969, now abandoned. This application Mar. 13, 1970, Ser. No. 019,433
Int. Cl. A01c *5/06;* **A01b** *63/16, 25/00*
U.S. Cl. 111—85 **12 Claims**



The present invention is generally useful in supplying fluent materials to the surface of the earth and has primary utility for planting grains, such as wheat, over grassland to provide winter pasture for livestock. In one form, apparatus embodying certain features of this invention may include a rectangular frame having a longitudinal axis and a front and a rear end. A plurality of earth-cutting means, such as disks, may be mounted underneath the frame adjacent the front end thereof with each of the disks aligned along an axis mounted at an angle to the longitudinal axis of the frame. A reservoir, such as a seed and fertilizer box, may be provided, preferably above and adjustable longitudinally with respect to the front gang of disks, and a plurality of channel means, such as seed and fertilizer tubes, may be provided extending from the lower portion of the seed box to a position near and above the lower edge of the disks. Means for pressing the seeded furrows may be provided adjacent the rear end of the frame; and in a preferred embodiment such furrow-pressing means may comprise a plurality of aligned disks, each of which is offset in its relationship to a corresponding disk in the front disk gang. Ground support means, such as a plurality of fluid filled tires, depend from the frame at an intermediate position on the frame between the front disk gang and the furrow-closing disks.

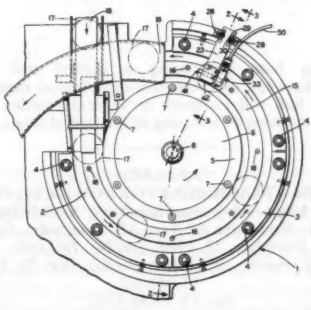
Means are provided to adjust the relative vertical position of the front disk gang and the furrow closing disks around the ground support mean. In addition, as an optional feature of this invention there may also be provided an outrigger assembly extending from the rear end of the frame for minimizing side drift of the apparatus.

3,604,379
KNIFE BLOCK FOR CUT PILE TUFTING MACHINE
James T. Cobble, Dalton, Ga., assignor to B & J Machinery Co. Inc., Dalton, Ga.
Filed June 12, 1970, Ser. No. 45,693
Int. Cl. D05c *15/24*
U.S. Cl. 112—79 R **8 Claims**



A knife block for a tufting machine having provision for securely retaining a pair of aligned cutting knives therein and having spaced lateral slots therein permitting a clamping bracket to engage one of the edges of each knife at spaced points. Also, provision is made for easily aligning and securing the block to an oscillating knife bar of a tufting machine by a structure which includes a cylindrical shaft connected to the block and having a slot positioned in the end thereof at a predetermined angle, an opening in the bar for receiving the shaft, and a key secured to the bar and adapted to enter the slot in the cylindrical shaft to maintain a predetermined alignment.

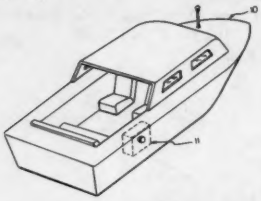
3,604,380
DOUBLE-END DETECTOR FOR CAN END CURLER
Paul F. Schmeltzer, Morrisville, Pa., assignor to Janetta Corporation, Glenside, Pa.
Filed Aug. 7, 1969, Ser. No. 848,180
Int. Cl. B21d *43/00*
U.S. Cl. 113—1 F **6 Claims**



A device for attachment to a curler for can ends for detecting the delivery of two telescoped can ends from a press

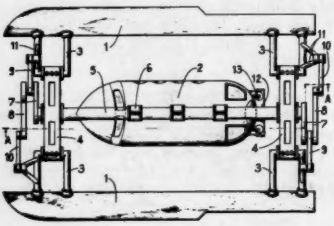
to the curler. A limit switch controlling the circuit to the motor means driving the curler and the press is operatively associated with a cam located in the path of the cAn ends as they are delivered to the curler from the press. The limit switch and cam are so adjusted that when two telescoped can ends contact the cam the switch will be opened stopping operation of the press and the curler.

3,604,381
POWER CABLE HANDLING DEVICE
Lawrence L. Neidenberg, Claridge Drive, Verona, N.J.
Filed June 11, 1969, Ser. No. 832,149
Int. Cl. B63b *35/00*
U.S. Cl. 114—0.5 **2 Claims**



Device for handling heavy-duty electrical power cable for enabling storage of the cable in a storage compartment and the connection of the cable to a power source, and including a storage compartment into which the cable is stored in free form and out of which the cable is driven for connection to a power source. The cable drive means includes a power driven drive roller and suitable coacting rollers for maintaining the cable in driving engagement with the drive roller, and a reversible motor for powering the drive roller.

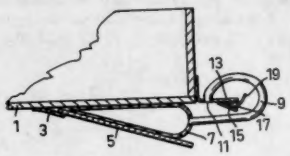
3,604,382
GLIDING BOAT
Angelo Sorrenti, Corso Moncalieri 466/6, Turin, Italy
Filed June 18, 1969, Ser. No. 834,373
Claims priority, application Italy, Mar. 13, 1969, 50961-A/69
Int. Cl. B63b *1/10*
U.S. Cl. 114—61 **6 Claims**



A gliding boat comprising a central hull pivotally suspended between two self-stabilizing lateral floats so that the central hull will maintain its vertical position independently of the raising or lowering of the lateral floats.

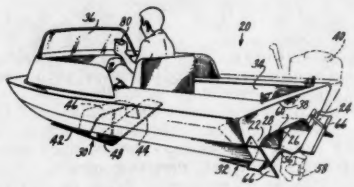
3,604,383
TRIM ATTACHMENT FOR POWER BOATS
Alf Martin Magnus Ingelman-Sundberg, Stockholm, Sweden, assignor to Hesselman Bil-Aero AB, Stockholm, Sweden
Filed Dec. 23, 1968, Ser. No. 786,195
Claims priority, application Sweden, Dec. 29, 1967, 17,958/67
Int. Cl. B63b *1/22*
U.S. Cl. 114—66.5 **9 Claims**

A trim plane or other control surface for a water vessel is operated by a pressure space such as a flexible bag between the trim plane and the hull or an extension thereof. The bag is inflated by water under pressure through a conduit leading from an opening in a surface subjected to the flow of water



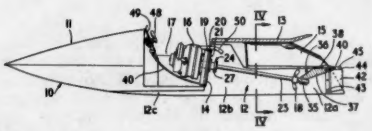
around the boat. The pressure may be changed by changing the surface geometry in the proximity of the opening. This may be accomplished by an auxiliary flap behind the opening which flap is operated by the pilot through remote control.

3,604,384
BOATS
Charles F. Coles, 24 Main St., Wenham,, Mass.
Filed Feb. 24, 1969, Ser. No. 801,324
Int. Cl. B63b *1/26*
U.S. Cl. 114—66.5 **3 Claims**



The present invention relates to a boat including a hull having an inboard tunnel and foils with dihedral surfaces coacting with the tunnel at both the bow and stern.

3,604,385
HIGH SPEED WATER CRAFT
Alan Reider, Mickleover, England, assignor to Dynamic Developments Limited, Leeds, England
Filed May 22, 1969, Ser. No. 826,813
Claims priority, application Great Britain, May 25, 1968, 25132/68
Int. Cl. B63b *1/20*
U.S. Cl. 114—66.5 **15 Claims**



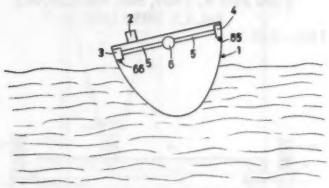
A power-driven high speed planing water craft has a screw propeller disposed in a longitudinally extending tunnel opening downwardly along the underside of the hull, the tunnel having a vent opening adapted to admit air, in advance of the propeller, above the water level when the craft is in operation, and preferably having also an abrupt step formation towards the front end. The hull can be moulded as a lightweight unitary structure in glass fiber reinforced plastics and may completely shield the propeller in the tunnel. The craft also preferably has a rudder system comprising a pair of interconnected angularly moveable parallel rudder plates which form a rear extension of the tunnel.

3,604,386

AUTOMATIC INSTALLATION FOR THE TRANSVERSAL BALANCING OF A SHIP

Edmondo Turci, Cornaredo, Italy, assignor to Filotecnica Salmoiraghi, S.p.A., Milan, Italy

Filed Dec. 19, 1969, Ser. No. 886,433
Claims priority, application Italy, Dec. 30, 1968, 25725A/68
Int. Cl. B63b *43/06, 39/00*
U.S. Cl. 114—125 7 Claims



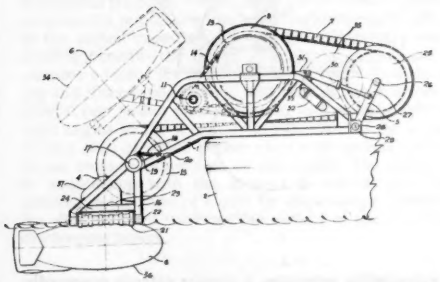
In an automatic installation for balancing a ship by means of the so-called "balanced tanks" method, the actual rate of flow of the liquid being transferred from either tank to the other is measured through the pressure differential between the two tanks. The differential between the "ordered" rate of flow and the actual rate of flow is computed by a comparison circuit. The instantaneous value of the differential rate of flow is used for adjusting the rate of flow of the variable delivery pump which is inserted in a conduit connecting the two tanks serially.

3,604,387

MEANS FOR LAUNCHING, TOWING AND RECOVERING AN OCEANOGRAPHIC TOWED BODY IN A SEAWAY

Neville E. Hale, Port Credit, Ontario, and Kenneth Gardner, Mimico, Ontario, both of, Canada, assignors to Fathom Oceanology Limited, Port Credit, Ontario, Canada

Filed Aug. 4, 1969, Ser. No. 847,129
Claims priority, application Great Britain, Sept. 3, 1968, 41748/68
Int. Cl. B63b *21/00*
U.S. Cl. 114—235 R 8 Claims



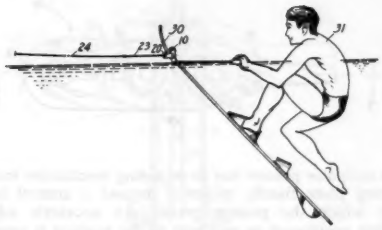
A cable wound around a winch on a vessel has an acoustic towed body attached to the free end of the cable which also passes over a sheave mounted outward of the vessel; a saddle assembly is pivoted on the sheave, the assembly supporting the acoustic body and lifting it out of the water for storage; inward of the winch is a cable-tensioning device which consists of another sheave carried on a pivotable arm which is moved towards and away from the winch by a piston and cylinder connected to an accumulator which maintains constant pressure on the arm and thereby moves it in response to the increase and decrease in the tension of the cable when the acoustic body is towed.

3,604,388

RELEASABLE WATER SKI TOWING DEVICE

Russell A. Brown, 715 Yale Place, S.W., Atlanta, Ga., and Paul W. Brown, 1831 Forrest Street, Memphis, Tenn.

Filed Sept. 17, 1969, Ser. No. 858,685
Int. Cl. B63b *21/00*
U.S. Cl. 115—6.1 17 Claims



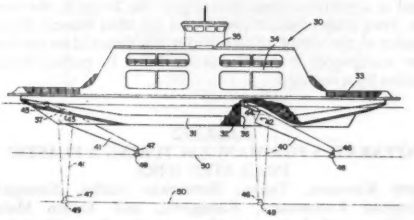
A towing device for towing water skis in which the ski or skis are removably clamped, the device being retained in place when the ski or skis are in a static condition, by pressure exerted by a pair of spring mechanisms, clamping the device to the ski or skis. Further clamping force is applied by pressure on the handle of the towing device when the skis are initially towed, the device being releasable when the pressure is released from the handle momentarily, for a sufficient length of time to permit the towing force applied to the towrope to overcome the pressure exerted by the spring mechanisms on the device and thereby allowing the towrope to strip the towing device off the end of the ski or skis. The device is made of buoyant material and floats on the surface of the water.

3,604,389

WATER TRANSPORTATION SYSTEM WITH SHORE-BASED PROPULSION

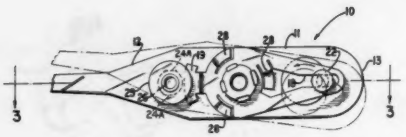
George G. Roberts, Woodside; David J. Seymour, San Francisco; Wilburt H. Reich, Novato, and Charles A. Black, Woodside, all of, Calif., assignors to Cable Ferry Systems, Woodside, Calif.

Filed Jan. 27, 1969, Ser. No. 794,319
Int. Cl. B63b *21/56*
U.S. Cl. 115—7 50 Claims



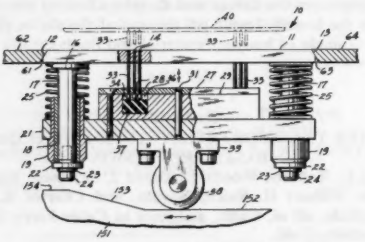
A ferry water transportation system wherein a freely floating vessel is propelled across the water by an underwater cable. The cable is moved by a winch driven from a power source, and both the winch and power source are located on shore, or on a floating terminal at shoreside. The vessel is guided and kept on course by the cable system, and its speed and direction are controlled from the vessel or from shore, as desired. The vessel thus has no onboard propulsion machinery; so the internal hull volume may be filled with foamed material to make the vessel unsinkable.

3,604,390
ECCENTRIC MICROADJUSTABLE POINTER
Earl Donald Zuck, Quakertown, Pa., assignor to Ametek, Inc., New York, N.Y.
Filed July 9, 1970, Ser. No. 53,496
Int. Cl. G01d *13/22*
U.S. Cl. 116—136.5 **4 Claims**



An indicator pointer has an adjusting mechanism including a spring plate fixedly mounted around a central bushing about which the pointer pivots. An eccentric adjusting member positioned on one side of the bushing is connected to the spring plate which is locked in its adjusted position by a locking member rotatably mounted in the pointer on the other side of the bushing.

3,604,391
APPARATUS FOR APPLYING INK TO HOLES
Joseph C. Mallia, Colonia, and John C. Walz, Bloomfield, both of, N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.
Filed May 16, 1969, Ser. No. 825,281
Int. Cl. B05c *1/02*
U.S. Cl. 118—50 **6 Claims**

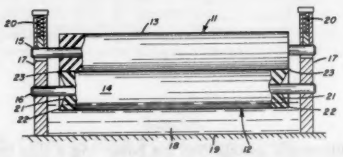


Material is applied to holes in a workpiece by transfer pins. The material is first introduced into holes in a template arranged in a pattern corresponding to the holes in the workpiece. Free ends of the transfer pins are then moved through the holes in the template to transfer the material to the holes in the workpiece. The material may then be pulled through the holes by a vacuum.

3,604,392
APPARATUS FOR MANUFACTURING A PLASTIC INSULATED WIRE
Chisato Kawazoe, Tokyo; Terumichi Ichiba, Kanagawa; Hiroyuki Kumamaru, Kanagawa, and Toshio Motegi, Kanagawa, all of, Japan, assignors to Sumitomo Electric Industries Ltd., Kitahama, Higashi-ku, Osaka, Japan
Filed Jan. 9, 1969, Ser. No. 790,140
Claims priority, application Japan, Jan. 1, 1968, 43/694
Int. Cl. B05c *11/00*
U.S. Cl. 118—67 **3 Claims**

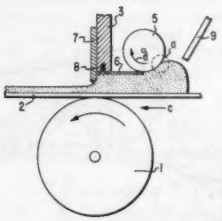
A water spray and water-filled means are positioned in tandem intermediate of a melted plastic insulation extruder which concentrically coats a moving conductor and the coated wire takeup means. A liquid bath or wet sponge contacts the cooled plastic insulated wire to suppress lateral vibration.

3,604,393
SQUEEGEE ROLLER ARRANGEMENT
Anthony Earle, Stevenage, England, assignor to Eastman Kodak Co., Rochester, N.Y.
Filed July 8, 1969, Ser. No. 839,962
Int. Cl. B05c *1/00*
U.S. Cl. 118—249 **4 Claims**



In an arrangement of a vertical pair of rollers for transporting a sheet therebetween while applying a liquid to the lower surface of the sheet, providing the ends of the lower roller with a concave configuration to prevent wetting the upper roller and the upper surface of the sheet.

3,604,394
COATING APPARATUS
Naoyoshi Ohno; Goro Akashi; Tokuaki Miyake, and Masaaki Fujiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 10, 1969, Ser. No. 805,555
Claims priority, application Japan, Mar. 9, 1968, 43/15276
Int. Cl. B05c *3/00*
U.S. Cl. 118—415 **4 Claims**

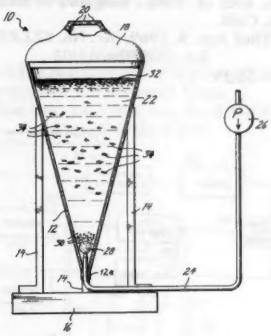


In a web-coating apparatus, a scraper extends rearwardly, parallel to the web being coated, from the doctor blade to, and in peripheral contact with, a roller disposed in the coating material accumulated behind the doctor blade.

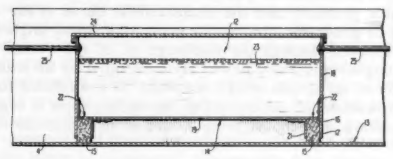
3,604,395
HATCHERY FOR BRINE SHRIMP EGGS OR THE LIKE
Stanley C. Huslin, 1503 Foulkrod St., Philadelphia, Pa.
Filed June 10, 1969, Ser. No. 831,839
Int. Cl. A01k *61/00*
U.S. Cl. 119—2 **2 Claims**

Apparatus is disclosed for hatching the eggs of aquatic animals such as brine shrimp or the like. In a presently preferred form, the apparatus comprises a water impervious vessel having the shape of an inverted cone, means for sup-

porting the vessel with its apex disposed downwardly, air outlet means disposed in the vessel adjacent its apex, and conduit means in fluid communication with the air outlet for supplying air to the diffuser and the interior of the vessel.



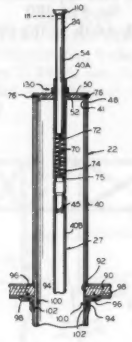
3,604,396
APPARATUS FOR HOUSING ANIMALS
Kurt Radach, Kuchen, Wurttenberg, Germany, assignor to Alfred Heinkel & Co., KG, Metallwarenfabrik, Hellmuth-Hirth-Strasse, Germany
Filed Oct. 25, 1968, Ser. No. 770,753
Int. Cl. A01k *31/00*
U.S. Cl. 119—22 **12 Claims**



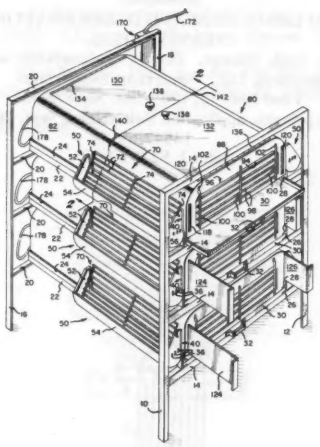
Apparatus for collecting and discharging excrements from animal cages, particularly cages for housing animals for experimental purposes, which cages are disposed in side-by-side relationship in one or more rows, including permeable floors in the animal cages, a collecting and discharging trough extending beneath the floors of a row of cages, and a slide member adapted for reciprocating motion within the collecting and discharging trough, said slide member incorporating at least one pusher plate extending in a plane at substantially right angles to the longitudinal extension of the trough, the surface area of which pusher plate corresponds substantially to the cross-sectional area of the trough. The slide member, in accordance with the present invention, may be constructed in the form of a tank for dispensing a disinfectant as the slide member traverses the surface of the collecting and discharging trough.

3,604,397
CAT PERCH AND EXERCISE POLE
Joseph M Salerno, 50 W. Elmwood Parkway, Elmwood Park, Ill.
Filed July 7, 1969, Ser. No. 839,185
Int. Cl. A01k *01/00*; **A63b** *09/00*
U.S. Cl. 119—29 **4 Claims**

The disclosure relates to a cat exercise device in the form of a post structure that is applied between the ceiling and the floor of a room, comprising a body portion that is proportioned to extend a substantial portion of the height of the room and a leg projecting from either end of the body portion to engage the room ceiling and floor, respectively, one of the legs being resiliently telescopingly mounted to accommodate varying ceiling heights and provide a biasing action to secure the post structure in its operating position. The post structure body portion intermediate its ends carries a shelf that is applied about same at an elevated position on the post structure and is interrupted to provide an access opening or gateway to the shelf. The shelf and the post structure body portion are covered with carpeting to provide a cat scratching post and elevated perch arrangement.

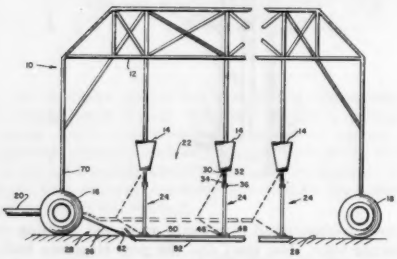


3,604,398
BROODER APPARATUS
David Lee Peardon, Reading, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.
Filed May 14, 1969, Ser. No. 824,531
Int. Cl. A01k *31/18*
U.S. Cl. 119—33 **10 Claims**



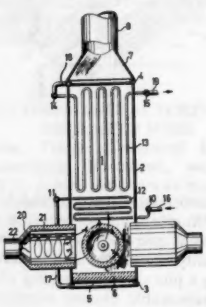
A support framework is adapted to slidably receive a plurality of brooders in overlying relationship to one another. The support means is provided with support members for supporting a plurality of feeders and waterers and for also slidably supporting a plurality of dropping pans. The brooder is provided with removable closure members in the upper part thereof and has a slot therein for receiving a divider. Holes are formed in the side of the brooder to be aligned with the feeders and waterers on the support means. Removable panels are provided for selectively closing off the holes in the side of the brooder. The brooder is provided with a heater at one end thereof and an opening at the opposite end thereof. Plug means is provided for selectively connecting a source of electrical current to the heater of the brooder.

3,604,399
ANIMAL RACE STARTING APPARATUS
William R. Mills, 2808 Warren Way, Arcadia, Calif.
Continuation-in-part of application Ser. No. 741,583, July 1, 1968, now abandoned. This application Jan. 15, 1969, Ser. No. 814,480
Int. Cl. A63k *13/00, 03/02*
U.S. Cl. 119—15.5 10 Claims



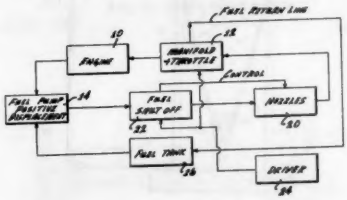
A starting gate apparatus for racing horses which includes a flexible, tread-producing, nonslip mat upon which the horses stand at the time of their initial forward thrust or takeoff. The system shown includes mechanisms for automatically and quickly lifting the traction mat covering the stall area over the track off the ground when it is desired to move the starting gate away from the starting location.

3,604,400
STEAM GENERATOR AND OTHER HEATED HEAT TRANSMITTERS
Harendra Nath Sharan, Zurich, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland
Filed Nov. 12, 1969, Ser. No. 875,857
Claims priority, application Switzerland, Sept. 26, 1969, 14542/69
Int. Cl. F22b *21/22*
U.S. Cl. 122—235 R 9 Claims



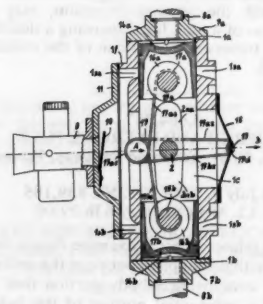
The steam generator is provided with a whirling combustion chamber capable of generating at least 10^7 kcal./cubic meter hour ata. The whirling combustion chamber is connected directly to a combustion gas flue containing heating tubes or surfaces therein. The walls of the combustion chamber do not require cooling means as such are lined with ceramic oxide material.

3,604,401
FUEL INJECTOR FOR INTERNAL COMBUSTION ENGINES
John F. Cogger, Los Angeles, and Happy H, Unfried, Northridge, both of, Calif., assignors to Kent H. Enderle, Seal Beach, Calif.
Filed Apr. 9, 1969, Ser. No. 822,831
Int. Cl. F02m *63/02*
U.S. Cl. 123—32 JV 11 Claims



The device is a fuel injector for internal combustion engines which matches fuel supplied to the engine's requirements over its operating range while maintaining an optimum fuel/air ratio in the supply to the engine. The fuel is supplied to a vortex valve or vortex generator which discharges a controlled conical spray of fluid into a manifold conduit leading to a cylinder. Opposite the spray is provided a pickup tube which picks up part of the sprayed fuel and returns it to the fuel tank. The pickup tube has orifices in its end, the shape of which is mathematically derived so as to match the quantity of fuel actually supplied to the cylinder to the cylinder's requirements over the operating range of the engine. The orifice shapes are derived from the characteristic curve of a positive displacement pump which delivers the fuel, that is, speed *v.* pressure, and the characteristic curve of the vortex valve or generator, that is, the pressure *v.* spray angle of the fuel sprayed through the discharge jet of the vortex valve. The engine speed and power are controlled by throttling the supply of air to the intake manifold. In a modified form of the invention the control jet of the vortex valve is regulated in response to exhaust temperature to maintain the fuel/air ratio.

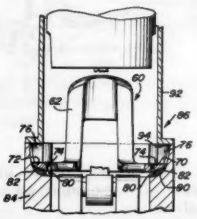
3,604,402
PISTON MECHANISM
Ernst Hatz, Ruhstorf, Germany, assignor to Motorenfabrik Hatz KG, Ruhstorf, Germany
Filed Aug. 21, 1969, Ser. No. 851,944
Claims priority, application Germany, Sept. 12, 1968, P 17 76 054.2
Int. Cl. F02b *75/24, 75/32*
U.S. Cl. 123—56 C 9 Claims



A piston mechanism having preferably one or two pairs of opposed cylinders with reciprocating pistons therein. A shaft

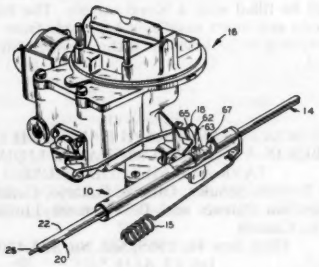
located between the pistons includes diametrically opposed cams thereon for directly and drivingly engaging the pistons. Springs urge the pistons against the cam parts and the spring can also operate a scavage air feeder. Valves can be operated by further cams mounted on the shaft.

3,604,403
TWO-STROKE ENGINE PISTON STUFFER
Marvin P. Larson, Rte. #5, Brainerd, Minn.
Filed Nov. 18, 1969, Ser. No. 877,656
Int. Cl. F02b *33/04*
U.S. Cl. 123—73 **13 Claims**



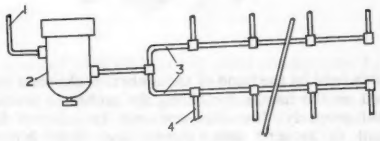
A crankcase mounted body projecting upwardly into the cylinder bore of a two-cycle internal combustion engine of the type utilizing crankcase air and fuel induction and bypass passages for ducting the air and fuel mixture from the crankcase into the cylinder above the piston therein as the piston approaches its lowermost position in the cylinder. The body is specifically shaped to have the piston telescoped downwardly thereover as the piston approaches its lower limit in the cylinder and the body, by its volume, reduces the total volume of the associated crankcase and lower cylinder bore whereby crankcase back pressure on the downstroke of the piston is increased for a greater discharge of air and fuel mixture into the cylinder above the piston. In addition, the body includes portions thereof which project substantially upwardly into the associated piston when the latter is at its lowermost position and which therefore serve to pump normally static air and fuel mixtures from within the piston each time the latter is telescoped downwardly over the body to thereby facilitate internal cooling of the piston.

3,604,404
ANTI-OVERRIDE MECHANISM
Dean L. Pitchford, New Castle, Ind., assignor to Dana Corporation, Toledo, Ohio
Filed Apr. 30, 1969, Ser. No. 820,418
Int. Cl. F02d *11/10;* **B60k** *31/00;* **G05q** *1/00*
U.S. Cl. 123—102 **2 Claims**



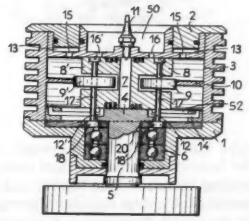
A structurally encapsulated assembly is disclosed which provides override for a speed control unit so that throttle advance by the vehicle operator, once set speed is reached, has no effect on the setting provided for the engine by the speed control unit. The encapsulated assembly is attached, at its one end to a cable connecting means extending to the speed control unit, at its other end to the pedal operated linkage and, therefore, is in series between them.

3,604,405
FUEL INJECTORS
William A. Maher, 9 Winters St., Vallejo, Calif.
Filed May 7, 1969, Ser. No. 824,027
Int. Cl. F02m *49/00*
U.S. Cl. 123—139 AJ **2 Claims**



An apparatus for the delivery of metered charges of pressurized fuel to the cylinders of an internal-combustion engine at timed intervals; by employing the alternating gaseous pressures developed within the combustion chambers of the engine. The pneumatically operated injector pumps, which are conjoined to the individual cylinders of the engine and the primary fuel supply system, replace the conventional mechanical or electrically driven components. Fuel to air ratio is controlled by the variable pressure applied to the diaphragms of the injector pumps and by the calibration of the fuel-flow metering discs of the injector nozzles.

3,604,406
ROTATING CYLINDER ENGINE
Michel Hottelet, 52 Ave. de Senateur, Girard 59, Valenciennes, France
Filed May 15, 1969, Ser. No. 824,976
Claims priority, application France, May 17, 1968, 19,103
Int. Cl. F02b *57/06*
U.S. Cl. 123—44 D **4 Claims**

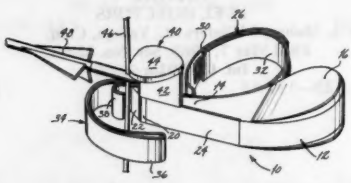


A rotary internal combustion engine having a rotor assembly provided with an inner cylinder containing a pair of opposed pistons having rollers at their outer ends bearing on an ovoid stationary surface for turning the rotor assembly.

3,604,407
BOWSTRING PULLING AND RELEASING DEVICE
Jack K. Wilson; Norman E. Wilson, and Robert S. Wilson, Rte 8 Box 33-H, all of Springfield, Mo.
Filed Mar. 28, 1969, Ser. No. 811,503
Int. Cl. F41c *19/00, 27/00*
U.S. Cl. 124—35 **11 Claims**

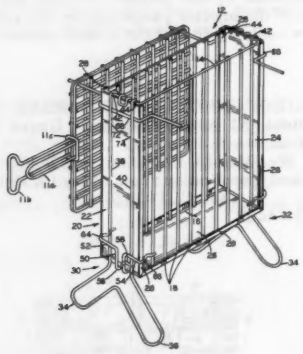
A bowstring-pulling device for facilitating pulling back and releasing a bowstring comprised of a handle which fits

within an archer's hand and securing means on the handle for releasably securing the bowstring to the handle. The securing means is a strap adapted to be wrapped around the bowstring and folded back against one side of the handle where it is



releasably held by the hand of the archer. A chin rest may be provided on the handle for aiding the archer in positioning his head properly. The chin rest may be adapted for attachment to archer's tabs, gloves, and other bowstring-pulling devices.

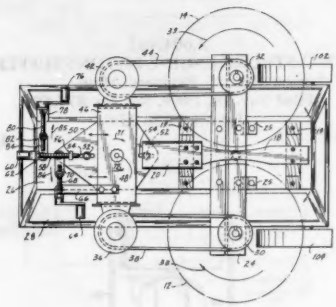
3,604,408
BARBECUE GRILL APPARATUS
John C. Tescula, 22810 Westwood Rd., Fairview Park, Ohio
Filed Aug. 28, 1969, Ser. No. 853,674
Int. Cl. A47j *37/00;* **F24b** *3/00;* **F24c** *1/16*
U.S. Cl. 126—25 R **6 Claims**



A vertical-type barbecue grill comprised of a wire basket enclosed on the bottom and two vertical sides by a U-shaped sheet metal housing member. The basket and the housing are releasably connected by clip members formed on independent wire legs arranged to support the unit in the proper orientation for cooking. Supported wires extend outwardly from the legs for adjustably supporting food holders adjacent the open sides of the basket.

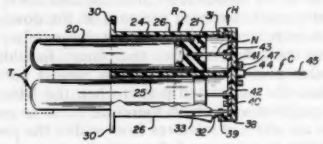
3,604,409
BALL PROJECTING MACHINE WITH DIRECTION CONTROL MECHANISM
Ralph W. Doeg, Saint Petersburg, Fla., assignor to Strokemaster Corporation, St. Petersburg, Fla.
Filed Jan. 30, 1969, Ser. No. 795,220
Int. Cl. F41b *15/00*
U.S. Cl. 124—1 **9 Claims**

A baseball-pitching machine having two horizontal, oppositely rotating wheels for engaging a baseball and pitching it to a batter. The wheels are driven through variable drive pulleys, and to curve the ball, the pulleys are adjusted to rotate one wheel faster than the other. To vary the speed of the ball being pitched the motor bracket is adjustable to be shifted toward or away from the wheels. The direction of throw, both horizontal and vertical, are controlled by



manually operated levers connected to pivotally mounted platforms. The machine is mounted on a portable stand which is exceptionally stable.

3,604,410
MULTITUBE BLOOD SAMPLER
Gary L. Whitacre, P.O. Box 130 610 Highway 86, Castle Rock, Colo.
Filed Sept. 11, 1968, Ser. No. 759,002
Int. Cl. A61b *5/10;* **A61m** *1/00*
U.S. Cl. 128—2 **13 Claims**

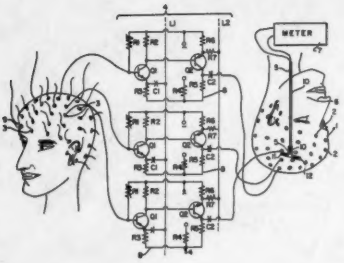


A multitube blood sampler of a type which uses two, three or more evacuated sample tubes of the type which are closed by rubber stoppers. The sampler combines a retainer which holds the sample tubes and a head fastened onto the front of the retainer which carries a forwardly projecting cannula and rearwardly projecting insert needles. The insert needles, within the retainer, pierce the rubber stoppers of the tubes. The unit is completed by a branched passageway within the head which connects the cannula to the insert needles so that when the cannula is inserted into the vein of a patient and the insert needles inserted into the several tubes, all of the tubes will be filled with a blood sample. The head carrying the cannula and insert needles is separable from the retainer and preferably, is provided as a throwaway unit once it has been used.

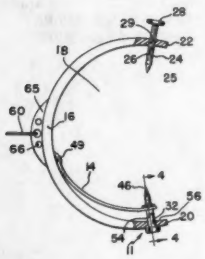
3,604,411
ELECTROENCEPHALOGRAPH HAVING METER PROBE MOVABLE IN A CALVARIUM-SHAPED LIQUID FILLED TANK AND METHOD OF USE
Graham Travers Schuler, Ottawa, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada
Filed June 16, 1969, Ser. No. 833,420
Int. Cl. A61b *5/05*
U.S. Cl. 128—2.1 B **4 Claims**

An electroencephalograph wherein movable electrodes are attached to positions on a scalp corresponding to the positions of fixed electrodes on an inverted, calvarium-shaped hollow member of electrical insulating material, for example, methyl methacrylate. Differences between electrical poten-

tials in each of the movable electrodes are amplified and passed to the corresponding fixed electrode, so that by moving a probe around in a saline solution in the hollow member an indication of the distribution of electrical potential of the brain may be obtained.



3,604,412
THERAPEUTIC DEVICE
William J. Gardner, 13700 Shaker Blvd., Cleveland, Ohio
Filed Sept. 16, 1968, Ser. No. 759,941
Int. Cl. A61h *1/02*
U.S. Cl. 128—75 7 Claims

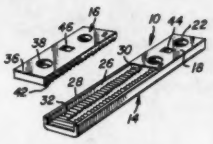


A thereapeutic device for applying clamping and traction force components to selective portions of an animate body including a yokelike frame having opposed abutment mechanisms disposed adjacent the ends of the frame. The abutment mechanisms include a resiliently responsive pin assembly and a selectively adjustable pin assembly with a calibration device associated with one of the pin assemblies and the frame for automatically applying a predetermined pressure on the body upon actuation of one of the pin assemblies. A traction mechanism is mounted on the frame for applying a traction force to the frame and to the body via the pin assemblies.

3,604,413
PROCESS FOR THE PREPARATION OF STIFF SUPPORTING BANDAGES CONTAINING A THERMOPLASTIC MOULDING COMPOSITION
Karlheinz Burg, Hofheim-Taunus; Harald Cherdron, Wiesbaden, and Johannes Brandrup, Neu-Isenburg, all of, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft, vormals Meister Lucius & Bruning, Frankfurt/Main, Germany
Filed May 15, 1969, Ser. No. 825,075
Claims priority, application Germany, May 24, 1968, P 17 67 564.8
Int. Cl. A61f *5/04*
U.S. Cl. 128—90 2 Claims

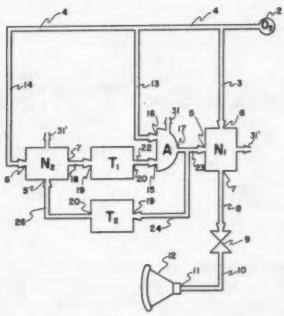
Copolymers of trioxane with determined cyclic formals are used for making stiff supporting bandages. The thermoplastic-moulding compositions are applied in the plasticized state without a carrier material or together with a fabric to the part of the body to be treated and then allowed to solidify.

3,604,414
BONE SETTING DEVICE
Nicomedes Borges, Cable 13-A Colinas de Vista Alegre, Caracas, Venezuela
Filed Aug. 29, 1968, Ser. No. 756,206
Int. Cl. A61f *5/04*
U.S. Cl. 128—92 D 1 Claim



An osteosynthesis plate of two-piece construction having a toothed rack system to enable sliding movement of the two pieces in a direction to move the plate pieces in a direction to achieve the greatest approximation of a fractured bone to facilitate joining the fracture in the bone. The plates are secured to the fragments of the bone by screw members and a tool for moving the plates toward each other is provided to facilitate engagement with the plates after they have been attached to the fragments of the fractured bone.

3,604,415
PATIENT VENTILATOR
Richard J. Hoenig, Seaford, N.Y., assignor to The Foregger Company, Inc., Smithtown, L. I., N.Y.
Filed Apr. 14, 1969, Ser. No. 815,696
Int. Cl. A61m *16/00*
U.S. Cl. 128—145.8 5 Claims

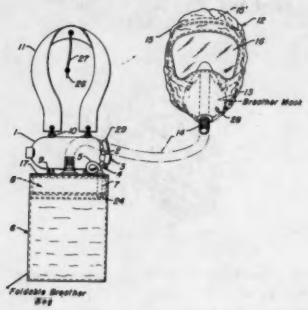


A ventilator for artificial respiration is automatically controlled by a fluid logic circuit comprising three pneumatic logic cells, all fed directly with ventilating gas under pressure, and two delay cells for separately adjusting gas flow to the periods of inhalation and exhalation of a patient.

3,604,416
EMERGENCY OXYGEN SYSTEM
Joseph A. Petrahai, Fairfield; James E. Bellemare, Madison, and August J. Hildenbrandt, Jr., Fairfield, all of, Conn., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed Apr. 28, 1969, Ser. No. 822,853
Int. Cl. A62b *25/00*
U.S. Cl. 128—142.3 7 Claims

A lightweight, portable oxygen supply system embodying a face-breathing mask and eye protection hood, a foldable breather bag, flexible tubing for connecting the mask and breather bag, flexible tubing for connecting the mask and breather bag, a gaseous oxygen supply pressure container (with special adsorbent therein to increase oxygen storage capacity) which connects through special valve-regulator

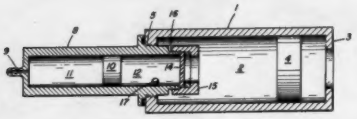
means to the breather bag, and a gas permeable bed of carbon dioxide absorbent provided between the mask and the breather bag, but preferably adjaCent or partially within the latter, so as to preclude carbon dioxide buildup in the system.



3,604,417
OSMOTIC FLUID RESERVOIR FOR OSMOTICALLY ACTIVATED LONG-TERM CONTINUOUS INJECTOR DEVICE

Sidney Joseph Stolzenberg, Yardley, assignor to Wayne Henry Linkenheimer, Upper Makefield Township, Bucks County, both of, Pa. and American Cyanamid Company, Stamford, Conn.

Filed Mar. 31, 1970, Ser. No. 24,136
Int. Cl. A61m *05/00*
U.S. Cl. 128—213 **2 Claims**



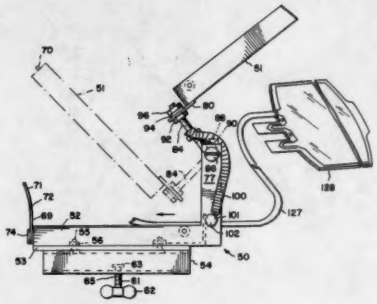
An improved osmotic pressure actuated injection device for long term continuous injection which has a chamber filled with the medicament to be injected and a suitable injection orifice, with a piston or similar device, the other side of he piston being a concentrated solution, such as a saturated solution, caPped with a semipermeable membrane and exposed to a second chamber having the solvent for the solution, and a freely movable piston exposed on its other side to atmospheric pressure or similar source so that the solvent moves through the semipermeable membrane increasing the osmotic pressure and so forcing the piston in the first chamber to discharge a small amount of medicament. The pressure in the solvent chamber is maintained constant, thus preventing formation of air pockets therein.

3,604,418
APPARATUS FOR STRIPPING FLUID FROM FLEXIBLE PLASTIC TUBING

Young C. Jones, c/o Graham and Graham, Attorneys at Law, Anderson Building, Gulfport, Miss. 39501

Continuation in part of Ser. No. 585,127, Oct. 7, 1966. This application filed Mar. 10, 1969, Ser. No. 805,530
Filed Mar. 10, 1969, Ser. No. 805,530
Int. Cl. A61m *1/02;* **B65d** *35/28*
U.S. Cl. 128—214 **4 Claims**

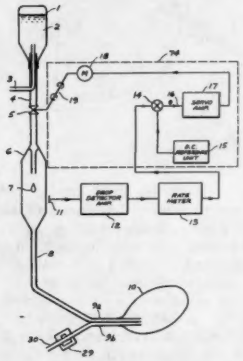
A pair of frame members are hingedly connected together and have cooperating rollers secured thereto for receiving therebetween a fluid-filled plastic tubing. The space between the rollers is adjustable to receive different sizes of tubing. A tubing guide is provided adjacent the rollers and is adjustable transversely thereto.



3,604,419
APPARATUS FOR URINARY BLADDER TREATMENT

Mordechai Haim Diskin, Haifa; Amnon David, Tel Aviv, and Alexander Vilensky, Haifa, all of, Israel, assignors to Technion Research & Development Foundation, Ltd.

Continuation-in-part of application Ser. No. 588,643, Oct. 5, 1966, now Patent No. 3,481,334. This application Sept. 19, 1968, Ser. No. 760,887
Int. Cl. A61m *3/00*
U.S. Cl. 128—227 **1 Claim**



A device for maintaining a constant flow of irrigating fluid through the bladder comprising a flow detector which generates an output signal as a function of the flow rate, a rate meter with its input connected to the output of the detector and which produces an electrical signal whose magnitude is proportional to the flow rate, a servomechanism with its input connected to the output of the rate meter, the mechanism producing output corresponding to the signal at its input, and a flow regulator in the hydraulic line supplying fluid to the detector which is controlled by the output of the mechanism.

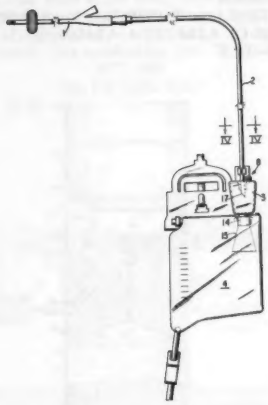
3,604,420
CLOSED SYSTEM DRAINAGE DESIGN

Vincent L. Vaillancourt, Livingston, N.J., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Jan. 21, 1969, Ser. No. 792,565
Int. Cl. A61f *5/44*
U.S. Cl. 128—275 **7 Claims**

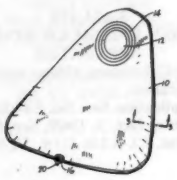
Means for eliminating the negative pressure problem in a closed urinary (or other) drainage system by shaping or con-

ditioning the interior surface of the drainage tube to overcome differentially the surface tension of the liquid in the tube, permitting air to enter and release the column of liquid,



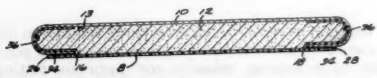
such means comprising making the lumen of the tube noncircular (ridged or grooved), and, where needed. providing a slanting cut opening at the lower end of the tube.

3,604,421
DISPOSABLE BAG FOR MEDICAL USE SANILOK BAG
Raymond R. Pizzella, 301 Elm St., Cranford, N.J.
Filed Apr. 23, 1969, Ser. No. 818,705
Int. Cl. A61f *5/44*
U.S. Cl. 128—283 **1 Claim**



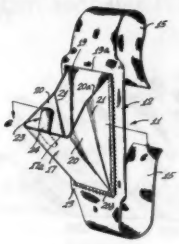
A plastic disposable sealed hollow bag for use in draining bodily fluids, and collection excretions, or as an ice bag or the like having a sealable integral drain valve and a drain opening of variable size.

3,604,422
DIAPER WITH SOFT EDGES AND NONLEAKING SIDE SEAL
Reinhardt N. Sabee, 728 South Summit St., Appleton, Wis.
Filed Oct. 16, 1968, Ser. No. 767,940
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **13 Claims**



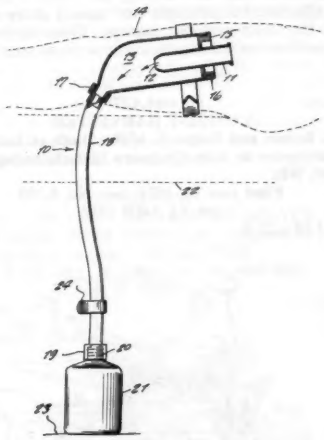
In several alternative embodiments, soft flexible edge-sealing film extending about the sides of an absorbent pad is shown fastened to the bottom ply and also fastened to the exterior or interior surface of the facing ply, joined integrally with the facing ply or extrusion bonded to the facing ply. The edge seal strips are optionally flocked or faced with tissue for further softness. The separately fabricated edge-sealing strips may have properties or qualities differing from those of the backing, examples being softness, pliability, pin strength, and cost.

3,604,423
ABSORBENT PAD WITH DISPOSAL WRAPPER
Elisabeth Fraser, 1533 North Martel Ave., Hollywood, Calif.
Filed June 27, 1969, Ser. No. 837,138
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 **9 Claims**



A sanitary napkin of the usual type having an elongated pad, with a folded disposable wrapper secured to outer side of the pad. The wrapper is in the form of a bag having rectangular inner and outer sheets marginally connected by triangular side sheets, one end of the outer sheet being releasably connected to the pad. After use of the pad, the opposite end portions of the soiled side are folded together, and the releasable end of the outer sheet is released and pulled around the folded pad to the opposite side, turning the bag inside out around the pad. An adhesive tab seals the package for disposal.

3,604,424
BLADDER RELEASE TUBE
Martin L. Windom, 496 Lawton St., S.W., Atlanta, Ga.
Filed June 12, 1969, Ser. No. 832,578
Int. Cl. A61f *5/44*
U.S. Cl. 128—295 **4 Claims**



An appliance for collecting urine from a male patient, the appliance comprising a rubber tube fitted over the penis of a male patient, the tube being connected to a receiving container at the upper end of the outlet tube secured by straps to the person's body, and the lower end of the outlet tube being connected to a collection container which can be periodically emptied.

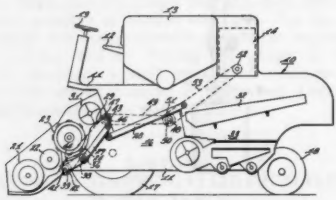
3,604,425
HEMOSTATIC CLIP
Pierre L. Le Roy, Wilmington, Del., assignor to New Research and Development Laboratories, Inc.
Continuation-in-part of application Ser. No. 473,055, July 19, 1965, now Patent No. 3,446,212. This application Apr. 11, 1969, Ser. No. 815,395
Int. Cl. A61b 17/08, 17/12
U.S. Cl. 128—325 6 Claims

A hemostatic clip is in the form of a tubular body member having a longitudinal slit extending completely across the body for receiving a wound flap when the body is distended from its original shape. A pair of projections are on the body member joined to the body member along a longitudinal line disposed about 90° from the slit to act as convenient means for distending the body from its original shape when external force is aPplied to the projections.

3,604,426
METHOD OF APPLYING SEMISOLID BACTERIOSTATIC PADS TO URINARY
Richard E. Erickson, Keene, N.H., assignor to Elliot Laboratories, Inc., Fitzwilliam, N.H.
Filed May 6, 1969, Ser. No. 822,292
Int. Cl. A61m 25/00
U.S. Cl. 128—349 R 4 Claims

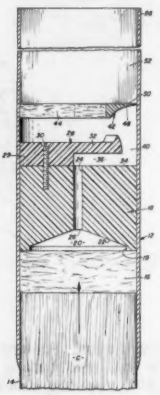
Wrapping around the shaft of a body catheter a bacteriostatic pad made of a nonwoven fabric impregnated with a bacteriostatic agent incorporated in a semisolid base to form a protective bacteria barrier around the catheter shaft at its entry into the urinary meatus. The semisolid base holes the bacteriostatic agent in intimate contact with the catheter shaft and the meatus surrounding the catheter shaft to provide an effective bacteriatight seal against entry of bacteria between the shaft and the meatus. Thus, it prevents the migration of bacteria along the catheter shaft into the body.

3,604,427
COMBINE HARVESTER
Jerry C. Boone, and Edgar S. Miller, both of Independence, Mo., assignors to Allis-Chalmers Manufacturing Co., Milwaukee, Wis.
Filed Jan. 26, 1970, Ser. No. 5,700
Int. Cl. A01f 7/00
U.S. Cl. 130—27 K 3 Claims



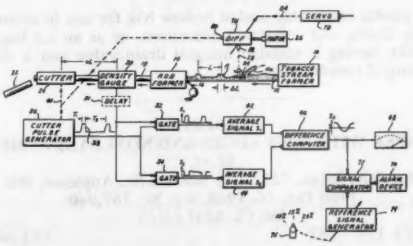
A combine harvester is provided with a threshing cylinder, an underlying coacting open concave and a conveyor underlying the concave for moving threshed material passing through the open concave to a cleaning shoe. The method of changing the open concave to a closed concave by disconnecting the conveyor drive and permitting the threshed material to fill the space between the conveyor and the upper surface of the concave.

3,604,428
CIGARETTE FILTER
A. K. Moukaddem, Abu-Samra St., Lufti Rabbara Building, Tripoli, Lebanon
Filed June 9, 1969, Ser. No. 833,889
Int. Cl. A24d 01/04; A24f 01/08, 01/16
U.S. Cl. 131—10.5 9 Claims



A combination tar-and-nicotine removal device which accelerates tobacco smoke and impinges same against a barrier in which each side of the accelerating device is enclosed by built-in plugs.

3,604,429
CIGARETTE-DENSE-END-MEASURING METHOD AND APPARATUS
John E. De Witt, Columbus, Ohio, assignor to Industrial Nucleonics Corporation
Continuation of application Ser. No. 544,000, Apr. 20, 1966. This application Oct. 3, 1969, Ser. No. 864,292
Int. Cl. A24c 5/18, 5/28
U.S. Cl. 131—21 19 Claims



The location of dense tobacco regions relative to the ends of cut cigarettes is determined by a density gauge positioned adjacent to a moving tobacco rod prior to cutting in a cigarette making machine and located therein by means of a signal from the density gauge which is divided by an electronic gating circuit into two components, one representative of the density of that portion of the rod that will provide the ends of the cut cigarettes and the other representative of that portion of the rod that will lie intermediate the ends. The signal components are averaged and an output signal proportional to their difference is obtained to indicate correct synchronization of the cigarette cutter with the dense end device. Pulses from the cutter may be presented simultaneously on a dual channel oscilloscope with the density signal to visually indicate an out-of-phase condition. Alternately, an out-of-phase condition may be indicated on a meter arranged in parallel with an alarm.

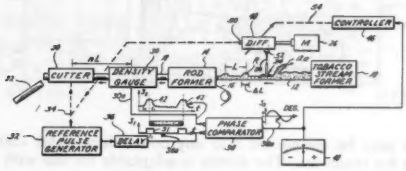
3,604,430
CIGARETTE DENSE END MEASURING AND CONTROLLING APPARATUS

Alan Norwich, and John E. De Witt, both of Columbus, Ohio, assignors to Industrial Nucleonics Corporation

Continuation of application Ser. No. 543,916, Apr. 20, 1966, now abandoned. This application Nov. 7, 1969, Ser. No. 871,549

Int. Cl. A24c *5/32*

U.S. Cl. 131—21 B **16 Claims**



A dense end controller is provided for a cigarette machine having means for making a continuous cigarette rod having dense tobacco regions spaced along the length thereof and a cutter. A density gauge provides a first signal proportional to the density of the tobacco rod. A phase comparator, such as a synchronous detector, continuously compares the phase of the periodic variations in the first signal relative to the phase of pulses in a second signal from the cutter to provide a control signal directly proportional to any deviation of said dense tobacco regions from the ends of cut cigarettes.

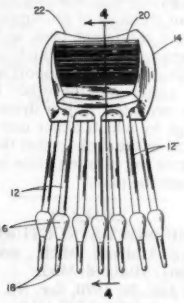
3,604,431
HAIR STYLER

Harold E. Pearson, West Hollywood, Fla., and Eugene Francis Lutz, Oak Lawn, Ill., assignors to The Gillette Company, Boston, Mass.

Filed Feb. 28, 1969, Ser. No. 803,346

Int. Cl. A45d *24/04*

U.S. Cl. 132—137 **3 Claims**



A hair-styling aid comprising a base member, a plurality of prongs each extending outwardly from an attachment location on said base member and terminating in a tip, each prong having a bulb portion intermediate the tip and the attachment location, the attachment locations being disposed in a plurality of tiers.

3,604,432
COIN COUNTER

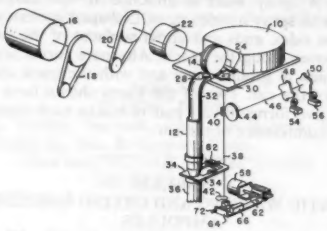
John K. McCollough, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed July 14, 1969, Ser. No. 841,487

Int. Cl. G07d *9/00*

U.S. Cl. 133—8 R **4 Claims**

Method and apparatus to electrically control a coin counter which is supplying a predetermined number of coins to a coin-wrapping station. The method includes a means to stop the action of the coin impeller upon the detection of passage of the preselected number of coins.



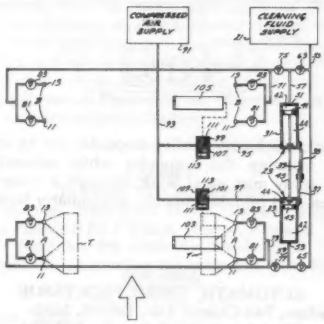
3,604,433
WHEEL WASHING APPARATUS

Ernst F. Notthoff, Canoga Park, Calif., assignor to California Car Wash, Sun Valley, Calif.

Filed Jan. 27, 1969, Ser. No. 794,246

Int. Cl. B08b *3/04*

U.S. Cl. 134—45 **10 Claims**



Wheel washing apparatus comprising first and second nozzle means disposed in sequence, adjacent the path of an automobile for washing a tire thereof. Cylinder means is provided for delivering pressurized cleaning fluid to the first nozzle means when the tire is disposed there in front of for washing one-half the outer wall of such tire and subsequently providing pressurized cleaning fluid to the second nozzle means when such tire is disposed there in front of for washing the second half of such outer wall.

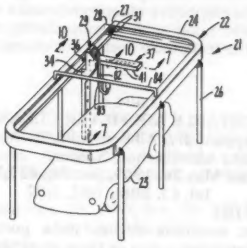
3,604,434
AUTOMATIC CARWASH APPARATUS

Mowatt M. Hurst, Menlo Park, Calif., assignor to Malsbary Manufacturing Company, Oakland, Calif.

Filed Mar. 21, 1969, Ser. No. 809,182

Int. Cl. B60s *3/04*

U.S. Cl. 134—58 **10 Claims**



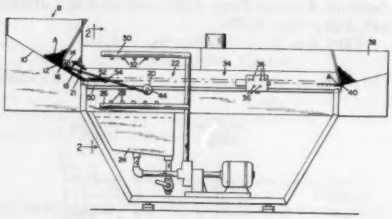
An automatic carwash apparatus having a carriage moving along a track mounted in spaced relation to the car. Positive

stops halt the carriage at the ends of the track and limit switches reverse the movement of the carriage at the ends of the track. A spray head is attached to the carriage and equipped with spray nozzles in an L-shaped pattern oriented to spray the sides, ends and upper surfaces of the car as the carriage moves along the track. Alternate forms are shown with the track at ground level and with the track above the roof level of the car. Two of the forms shown have a single track, and two forms have a pair of tracks each surrounding half the circumference of the car.

3,604,435
AUTOMATIC WASHING AND DRYING MACHINE FOR AMPOULES

Raymond A. Day, Jr., Nassau; Sherwin Epstein, Albany, and Robert F. Pulfer, New Scotland, all of, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Apr. 18, 1969, Ser. No. 817,393
Int. Cl. B08b *3/02*
U.S. Cl. 134—61 **3 Claims**

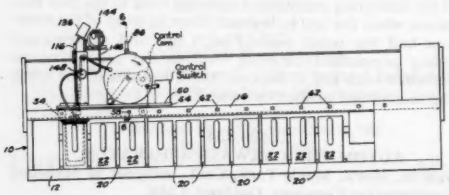


Automatic machinery feeding ampoules one by one from a magazine, rotating the ampoules while advancing them through a spray mist water wash, through a compressed air drying area, and into an ampoule accumulator having a bottom feed.

3,604,436
AUTOMATIC TISSUE PROCESSOR

Julius Lipshaw, 744 Central Ave., Detroit, Mich.

Filed Apr. 7, 1969, Ser. No. 814,123
Int. Cl. B08b *3/00*
U.S. Cl. 134—76 **10 Claims**



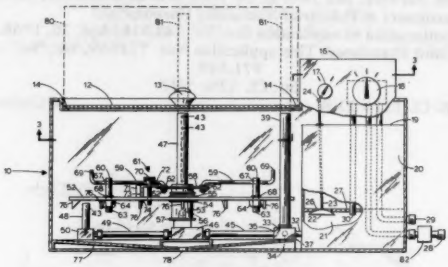
A mechanism for processing tissue for biological study which includes a container to be transferred to a series of treating stations where it is immersed in liquid and subject to a reduced pressure atmosphere including a sealing plate which closes the respective receptacles, and a mechanism for exerting pressure upon such closure during the immersion period to seal the receptacle during the vacuum period.

3,604,437
PORTABLE AIR FILTER CLEANER

William T. Tappan, Jr., Albuquerque, N. Mex., assignor to Tamonite, Inc., Albuquerque, N. Mex.

Filed May 26, 1969, Ser. No. 827,734
Int. Cl. B08b *3/02, 5/02*
U.S. Cl. 134—102 **4 Claims**

The present invention relates to a portable air filter cleaner, and comprises a two or three stage washing and drying system, and process wherein alternatively air or liquid cleaning solvent may be sprayed onto the inside and outside of an air filter simultaneously while it is being rotated for dry cleaning or wet cleaning and air drying the filter. The system is constructed so as to be portable so that it may be moved from one place to another, occupying a minimum of space,

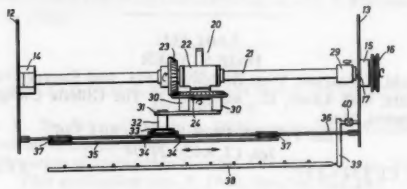


and it may be connected into any convenient water and air outlet for ready use. The device is adaptable for use with any size air filter.

3,604,438
MACHINE FOR ETCHING AND RINSING PRINTING PLATES

Kurt Fries, Markgroninger Strasse 64, Stuttgart-Zuffenhausen, Germany

Filed Aug. 13, 1969, Ser. No. 849,725
Claims priority, application Germany, Aug. 24, 1968, P 17 97 173.2
Int. Cl. B08b *3/02*
U.S. Cl. 134—148 **6 Claims**

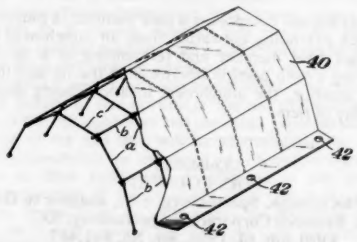


A machine for etching and washing both cylindrical and flat printing plates of metal or of photopolymerizable material which comprises a treatment tank and two different interchangeable mounting supports which can be fitted selectively in the tank. One mounting support is arranged for supporting cylindrical plates and the other for supporting flat plates. The tank is provided with a drive and the two supports have couplings by which either can be coupled to the drive when it is fitted in the tank so that the support is moved by the drive to agitate the printing plate in liquid in the tank to either etch or wash the plate.

3,604,439
SUPPORT STRUCTURE

Laddie M. Thomka, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 26, 1970, Ser. No. 5,568
Int. Cl. A45f *1/16*
U.S. Cl. 135—4 **9 Claims**



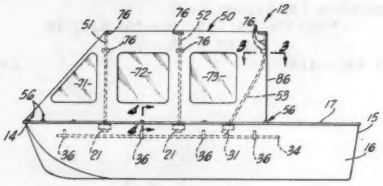
A structural framework for tarpaulins, camouflage netting or other such covers. The framework comprises adjustable

interchangeable lightweight struts, the adjustment being provided by a joint mechanism which comprises mating rotatable heads on the ends of the struts. The joint mechanism permits locking the structure's struts at desired angles to form, as an example, arches. Such arches can be connected with other like arches to form the framework. Part of such interconnection is facilitated by transverse flanges extending from certain ends of said struts. When not in use or for transport, the joint mechanism of the struts permits folding of the struts compactly together.

3,604,440
BOAT CANOPY

Benjiman L. Wilson, 1827 Los Robles Boulevard, Sacramento, Calif.

Filed Aug. 4, 1969, Ser. No. 847,066
Int. Cl. B63b *17/02*
U.S. Cl. 135—6 **4 Claims**

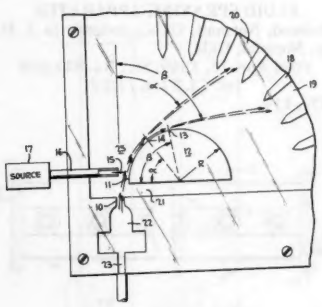


Mounted along the gunwales of a boat are opposite pairs of socket members each pair being arranged to receive, in clamping relation, the two ends of a flexible rod arched into an inverted U-shape. A plurality of such arches supports a windowed canopy provided with fasteners removably securing the canopy to the gunwales and the arches, thereby affording shelter to the occupants.

3,604,441
PROPORTIONAL ACOUSTIC TRANSDUCER

Donald O. Rockwell, Jr., Bethesda, and Kenji Toda, Rockville, both of, Md., assignors to The United States of America as represented by the Secretary of the Army

Filed Oct. 15, 1969, Ser. No. 866,675
Int. Cl. F15c *1/08*
U.S. Cl. 137—13 **10 Claims**

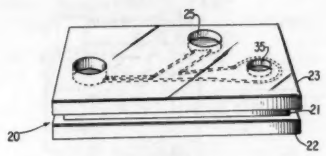


A proportional acoustic transducer and fluid demodulator. Proportionality of fluid output to acoustic input is achieved by causing a power jet to attach to a semicircular sidewall and directing acoustic signals at the power jet. The angle of deflection of the power jet provides a measure of the amplitude of frequency of the acoustic signal. Sensitivity of the system is greatest when the frequency of the acoustic input is close to the fundamental frequency of the settling chamber from which the power jet is derived.

3,604,442
FLUIDIC DIODE

Henry G. Tucker, Norwalk, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Aug. 15, 1968, Ser. No. 752,865
Int. Cl. F15c *4/00*
U.S. Cl. 137—81.5 **7 Claims**

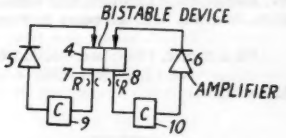


A fluidic diode wherein the forward direction input conduit angularly intersects a second conduit, the area of the second conduit from its intersection point to the forward direction output being smaller than the area of the second conduit from the intersection to the reverse direction output or vent. The wall of the second conduit toward the reverse direction output can be offset relative to the wall closest to the forward direction input conduit. The vent can be in the form of a vortex-producing chamber.

3,604,443
FLUIDIC OSCILLATORS

John Christopher Hammond Davis, Taplow, England, assignor to Plessey BTR Limited, Taplow, England

Filed Oct. 23, 1969, Ser. No. 868,803
Claims priority, application Great Britain, Nov. 28, 1968, 56,620/68
Int. Cl. F15c *1/08*
U.S. Cl. 137—81.5 **7 Claims**



In a pure fluid oscillator of the RC type having a long time constant, only the reference pressure is used and the arrangement is such that the pressure in the capacitor or capacitors of the oscillator decays to this pressure. The oscillator comprising a fluidic bistable device, one output of which is connected via a fluidic RC circuit to the input of a fluidic amplifier. The output of this amplifier is so connected to an input of the bistable device that the bistable device changes from a first state to a second state when the input to the amplifier reaches a predetermined pressure. The invention is applicable to monostable circuits as well as to free-running oscillators.

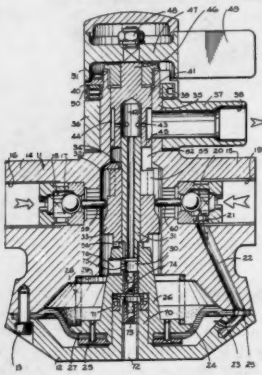
3,604,444
DEVICE FOR MIXING HOT AND COLD FLUIDS

Percy G. Tacchi, Bridgnorth, England, assignor to Well's Asbestos and Engineering Limited, Slough, Buckingham, England

Filed Nov. 19, 1969, Ser. No. 877,944
Int. Cl. F16k *19/00*
U.S. Cl. 137—111 **10 Claims**

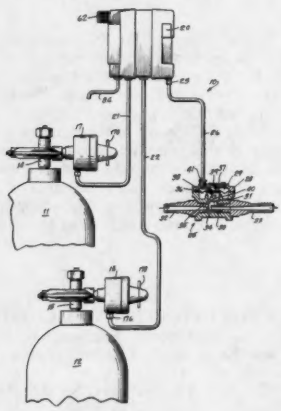
A device for mixing steam and cold water to provide a supply of substantially constant temperature hot water, com-

prising a body having inlet valves for the steam and water, each inlet valve being opened, against spring pressure, by a slidably mounted control rod with the free ends of the two control rods being both engaged by a control member movable in a chamber with the interior of the body in which the steam and water mix. A flexible diaphragm extends across the interior of the body with one side of the diaphragm exposed to the pressure in the mixing chamber and the other side exposed to the pressure of the cold water on the upstream side of the cold water control valve by means of a



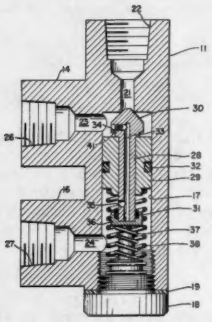
bypass passage leading from the cold water inlet. Connected to the diaphragm, on the mixing chamber side thereof, is a member which engages directly with one end of said control member. The control member has two discreet cam profiles on its exterior, one for each of the two control rods, and as the diaphragm moves, due to the differential pressure across it, the control member is moved so that the cam profiles engage the control rods to move these and open the cold water and steam inlet valves. The cam profiles are arranged so that the cold water inlet valve opens before the steam inlet valve and the steam inlet valve closes first.

3,604,445
SYSTEM FOR SUPPLYING GASEOUS MATERIAL TO A FLOW OF LIQUID
Richard W. Jordan, West Caldwell, and William C. Conkling, Essex Falls, both of, N.J., assignors to Pennwalt Corporation
Filed Apr. 2, 1969, Ser. No. 812,641
Int. Cl. G05d *11/00*
U.S. Cl. 137—113 **16 Claims**



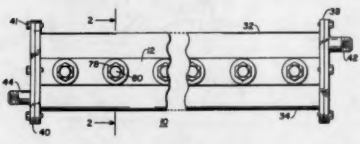
A chlorinating system wherein chlorine gas is supplied successively from a pair of cylinders to a flow of water. The system includes, in addition to means for injecting chlorine into the water flow and means for controlling the rate of delivery of chlorine to the injecting means, a pair of pressure-reducing valve units respectively mounted on the valve outlets of the two cylinders and connected through conduits to a common gas passage upstream of the controlling means. Each valve unit includes a valve for discharging chlorine, from the cylinder on which it is mounted, into the system at a reduced pressure; a pressure-responsive diaphragm for moving the valve between closed and open positions; and a latch for holding the diaphragm in a position at which the valve is closed. When one valve is open, discharging chlorine into the system from its associated cylinder, the other valve is closed. Depletion of chlorine in the first cylinder causes a decrease in system pressure which, communicated to the second valve unit, releases the diaphragm of the second valve unit from its latch to open the valve of this second unit, thus initiating discharge of chlorine into the system from the second cylinder as the first cylinder becomes exhausted.

3,604,446
VALVE
Brooks, Glenn R., Fallbrook, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed May 26, 1969, Ser. No. 827,745
Int. Cl. F16k *17/10*
U.S. Cl. 137—115 **4 Claims**



A fluid valve having an internal bypass orifice and a spring biased piston to which the fluid pressure is applied. When the pressure is above a given value, the piston moves compressing the spring, first cutting off the flow through the bypass orifice and afterwards opening the valve port to channel the fluid to a place of use.

3,604,447
FLUID SPRAYING APPARATUS
John H. Holland, Norman, Okla., assignor to J. H. Holland Company, Norman, Okla.
Filed Apr. 25, 1969, Ser. No. 841,648
Int. Cl. F16k *11/00*
U.S. Cl. 137—119 **6 Claims**



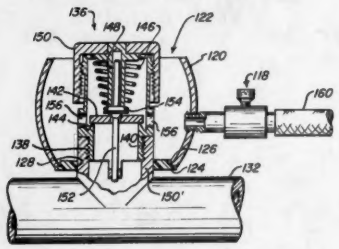
A spraybar for applying a coat of liquid asphalt or the like on the ground having a linearly spaced array of spray nozzles each in fluid communication with a "shoot" manifold through a separate fluid actuated valve. When asphalt is pumped into the shoot manifold, each valve is opened by the

pressure of the asphalt and asphalt is sprayed from the nozzles. When asphalt is pumped through a bypass manifold, the pressure of the asphalt closes the valves to the respective nozzles and opens a fluid bypass to the "shoot" manifold to maintain circulation. The valves may be either reciprocating or rotating, and any selected valve can be locked in the closed position.

3,604,448
CLOSED EXHAUST DISCHARGE SYSTEM FOR ANESTHESIA MACHINES

Rocco Anthony Marrese, 1024 Belleforte Ave., Oak Park, and William T. O'Sullivan, 1323 Ashland, River Forest, both of, Ill.

Continuation-in-part of application Ser. No. 790,372, Jan. 10, 1969. This application Nov. 5, 1969, Ser. No. 874,217
Int. Cl. A61m *17/00;* **F16k** *45/00*
U.S. Cl. 137—312 **2 Claims**

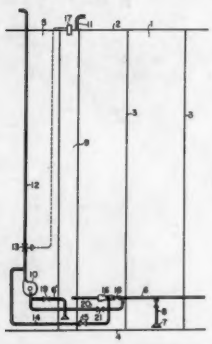


A relief valve for anesthetic gasline which is spring loaded to conventionally discharge overloading anesthetic gas into the surrounding atmosphere, and which further is provided with a valve assembly for connection to a closed system so that the overloading anesthetic gas is retained with the closed system and is not discharged to the surrounding atmosphere. The open system of the valve is maintained by making the spring-loaded valve operational, and the closed system is effected by opening the valve assembly so that overloading anesthetic gas is directed through the valve assembly into the closed system, preferably a surgical room vacuum line.

3,604,449
APPARATUS FOR UNLOADING LIQUID STORAGE TANKS

Shinpei Miyamoto, and Kohji Sato, both of Nagasaki-shi, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 17, 1969, Ser. No. 858,655
Claims priority, application Japan, Sept. 25, 1968, 43/69281
Int. Cl. F16k *31/18;* **B67d** *5/52*
U.S. Cl. 137—398 **6 Claims**

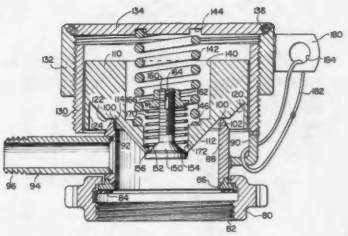


In unloading liquid from a plurality of storage tanks, such as in an oil tanker, a separation tank is positioned between an unloading pump and the storage tanks and a suction unit is used for supplying the liquid into the separation tank when the level in the storage tanks drops below a certain point. During ordinary unloading operations, the liquid is bypassed around the separation tank to the unloading pump. When in use, the liquid level in the separation tank is checked for regulating the flow from the unloading pump so that a flow of liquid is maintained through the unloading pump and supplied to the suction unit for maintaining the pumping operation regardless of the level to which the liquid drops in the tanks being unloaded.

3,604,450
VALVE CONSTRUCTION

Lawrence A. Botkin, Omaha, Nebr., assignor to Fruehauf Corporation, Detroit, Mich.

Filed Jan. 21, 1969, Ser. No. 792,294
Int. Cl. F16k *17/18*
U.S. Cl. 137—493.4 **8 Claims**

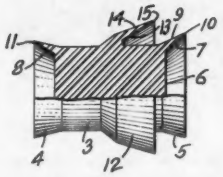


A valve seat means defines an opening for receiving a valve means and has a seating surface formed thereon. A chamfer is formed on the valve seat means between the opening and seating surface thereof. A valve means includes a sealing surface for engaging the seating surface of the valve means, and a spring means engages the valve means to urge the surfaces into sealing engagement. The valve means includes a poppet portion having a tapered surface which is in communication with a substantially straight cylindrical shoulder. This shoulder fits relatively closely within the opening in the valve seat means and is disposed adjacent the chamfer on the valve seat means. The shoulder on the valve means has a greater dimension in a direction extending substantially parallel with the direction of movement of the valve means than does the chamfer on the valve seat means.

3,604,451
PRESSURE-REDUCING VALVE

William B. Delamater, 9114 Valley View, Whittier, Calif.

Filed Nov. 12, 1969, Ser. No. 870,428
Int. Cl. F16k *15/14*
U.S. Cl. 137—512.15 **3 Claims**



A pressure-reducing valve is interposed between a source of liquid such as water and a discharge valve such as a nozzle

for the water. When the discharge valve is opened the pressure-reducing valve allows full volume pressure flow of the liquid from its source to the discharge valve and when the liquid discharge valve is closed the pressure-reducing valve automatically closes passage of liquid therethrough from its source. An opening of the discharge valve automatically opens the pressure reducing valve to again allow liquid under full volume and without pressure drop to flow through the pressure-reducing valve and outwardly of the discharge valve.

3,604,452

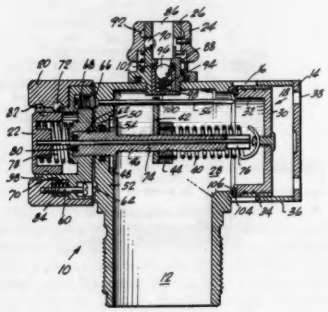
PRESSURE CONTROL DEVICE

Robert A. Daniels, 1103 West J7; Norman B. Foster, 1500 Kildare St., and Robert P. Yeomans, 43715 North Harwood, all of Lancaster, Calif.

Filed Feb. 5, 1968, Ser. No. 703,071

Int. Cl. F16k *15/18*

U.S. Cl. 137—523 **3 Claims**



A device for regulating fluid pressure in a container. Gross changes in flow through the container can be made with a minimum fluctuation in pressure. For example, the rate of flow may be increased four times with an increase in pressure of only one-sixteenth the original pressure.

3,604,453

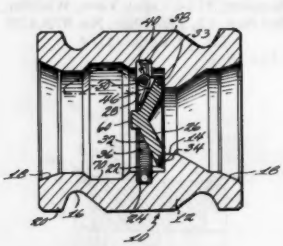
CHECK VALVE

Boyd Boitnott, Houston, Tex., assignor to Gray Tool Company, Houston, Tex.

Filed Oct. 24, 1969, Ser. No. 869,160

Int. Cl. F16k *15/03*

U.S. Cl. 137—527 **9 Claims**



A radially directed annular shoulder in the housing through passageway seats a flapper having opposed trunnions nearer one edge. The trunnions are received in a circumferential groove which is axially longer than the thickness of the trunnions to allow movement of the trunnions away from the seat. A spring received in the groove mounts the flapper; another urges the trunnions toward the seat and presses the flapper toward the seat. The flapper is thus free to move angularly of the housing to even out seat wear. The cross-sectional area of the housing passageway at the immediately downstream of the flapper trunnions remains circular, but is larger in area to accommodate the fluid flow plus the volume of the flapper when the valve is open. As flow is directed against the flapper from the upstream side, the second spring compresses and the flapper moves off the seat. At the same time, the flow tends to rotate the flapper about the axis of the trunnions which are acting against the springs. When fully open, only a small portion of the edge of the flapper is exposed to the flowing media; hence, a low pressure drop is experienced.

3,604,454

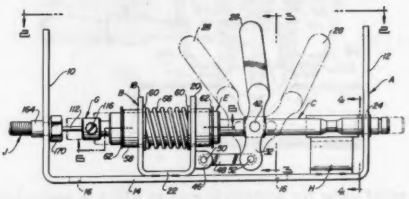
HYDRAULIC AND ELECTRIC CONTROL DEVICE

John K. Tomko, Euclid, and William W. King, Cleveland Heights, both of, Ohio, assignors to Meyer Products, Inc., Cleveland, Ohio

Filed Oct. 27, 1969, Ser. No. 869,685

Int. Cl. F15b *15/18*

U.S. Cl. 137—565 **9 Claims**



A hydraulic and electric control device for selectively opening and closing a hydraulic valve includes an actuating device for energizing an electric motor which drives a pump to send liquid through the valve. The control device is provided with a lost motion connection between the valve and the valve actuating device so that the electric motor will not be energized to operate the pump until the valve is in its maximum open position.

3,604,455

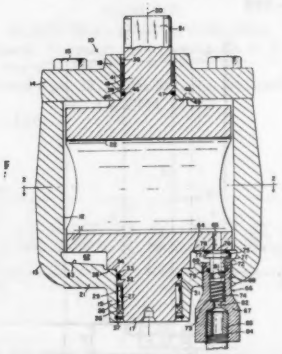
PLUG VALVE ASSEMBLY

David H. Therneau, Sulphur Spring, Tex., assignor to Rockwell Manufacturing Company, Pittsburgh, Pa.

Filed Jan. 30, 1969, Ser. No. 795,159

Int. Cl. F16k *45/00*

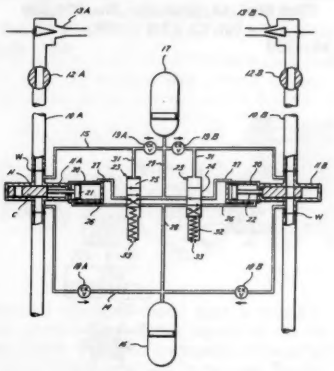
U.S. Cl. 137—583 **7 Claims**



A plug valve assembly wherein the chamber enclosing the rotatable plug is automatically vented to atmosphere when

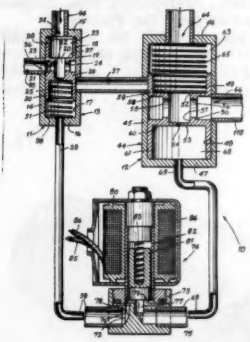
the valve is closed by a vent valve arrangement connecting the plug port to a passage terminating outside the body when the valve is closed.

3,604,456
OPERATOR FOR VALVES OR THE LIKE
Marvin R. Jones, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.
Filed June 4, 1970, Ser. No. 43,456
Int. Cl. F16k *31/12*
U.S. Cl. 137—594 23 Claims



There is disclosed an operator for a flowline valve wherein the energy for actuating the operator is derived at least in part from fluid pressure variations in the flowline. and in which signals for such operation may be derived from such variations.

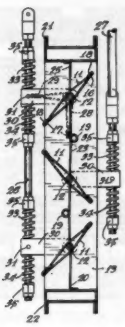
3,604,457
PILOT-OPERATED FOUR-WAY VALVE SYSTEM
Bradley C. Douglas, Kirkwood, Mo., assignor to Emerson Electric Co.
Filed Aug. 20, 1969, Ser. No. 851,538
Int. Cl. F16k *11/10*
U.S. Cl. 137—596.16 6 Claims



A pilot-operated four-way valve system. Two separate valves, one a high-pressure valve and the other a low-pressure valve are interconnected through a pilot valve. The high pressure and low-pressure valves each have a piston or slide the positions of which determine the direction of flow through alternate outlets from the valves. Opening or closing of the pilot valve establishes pressure conditions between the two valves to control the positions of the pistons therein.

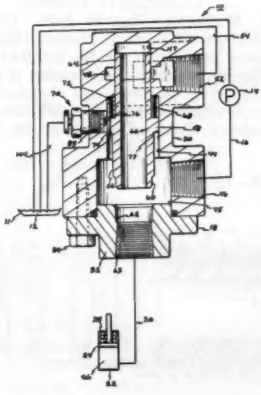
In a heating and cooling system, the four-way valve system alternately converts the system to cooling or heating. Conversion is initiated by energization or deenergization of the pilot valve. The pistons are spring-biased to positions for circulating refrigerant in a cooling cycle. When the pilot valve is reversed, the pistons are subjected to changed pressure conditions causing them to slide and change the porting for the flow of fluid through a heating cycle.

3,604,458
TEMPERATURE COMPENSATING DAMPER STRUCTURE
Harry J. Silvey, Hudson, Ill., assignor to Modine Manufacturing Company
Filed Feb. 13, 1969, Ser. No. 798,910
Int. Cl. F23l *13/08*; F24f *13/08*
U.S. Cl. 137—601 3 Claims



A temperature compensating damper structure adapted to be used to control flow of fluid and subject to extreme temperature changes in which the structure comprises a fluid control damper means such as a plurality of dampers mounted in a frame and movable between open and closed position, stop means against which the damper means bear when in the closed position and yieldable operating means such as springs for moving the damper means to this closed position, the yieldable operating means having a path of travel extending beyond the corresponding closed position of the damper structure against the stop means regardless of expansion and contraction of the damper structure parts during temperature changes therein.

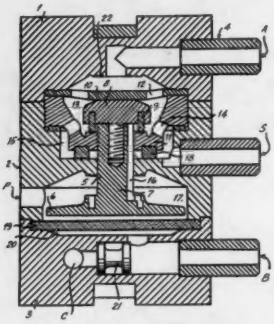
3,604,459
CARTRIDGE VALVE
Nils O. Rosaen, 3774 Quarton Rd., Bloomfield Hills, Mich.
Filed Feb. 24, 1970, Ser. No. 13,500
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.6 11 Claims



A fluid valve having a sleeve portion and a pilot portion; the sleeve portion being actuated by the pilot portion to

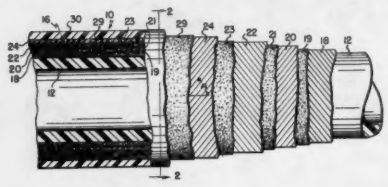
move between a first position in which fluid under pressure is detected to a fluid user and a second position in which fluid is exhausted from the fluid user through the fluid valve to a reservoir.

3,604,460
PNEUMATIC CONVERTIBLE RELAY CAPABLE OF PERFORMING LOGIC FUNCTIONS
Gerard C. C. J. Delrue, Pontarlier, France, assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Feb. 14, 1969, Ser. No. 799,305
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.66 **7 Claims**



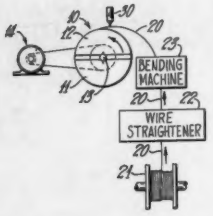
A pneumatic convertible relay capable of performing logic functions has a relay body that includes a control mechanism for moving a valve member. The valve member includes a slideable stem with a foot on one end and a head on the other end. For a normally open construction the head carries an angular valve head seal and in normally closed construction the foot also carries a seal for controlling flow between a mating seat and a passage along the slidable stem. The valve body is in three sections and includes an inlet, an outlet, an exhaust, and two control openings. The control mechanism includes a diaphragm positioned to act on the foot of the valve member under control of pressure applied to either of the control openings. A slideable shuttle provides alternative operation. The valve is convertible from a normally open construction to a normally closed construction by changing the position of a passage in a valve seat to connect either the inlet to the outlet or the exhaust to the outlet and the position of the annular valve seal, while the other components remain the same.

3,604,461
COMPOSITE TUBING
Richard A. Matthews, Chagrin Falls, Ohio, assignor to Samuel Moore and Company, Mantua, Ohio
Continuation of application Ser. No. 639,040, Aug. 30, 1970, now abandoned , which is a continuation of application Ser. No. 509,514, Aug. 24, 1965, now abandoned , which is a continuation of application Ser. No. 509,530, Aug. 24, 1965, now abandoned. This application Apr. 20, 1970, Ser. No. 30,265
Int. Cl. F16l *11/04, 11/08*
U.S. Cl. 138—137 **11 Claims**



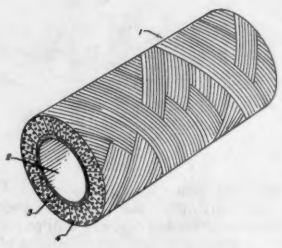
A composite tubing product for high-pressure fluid transmission having an inner core tube made from a flexible polymeric material, a flexible reinforcement member disposed around the core tube and including a plurality of coplanar layers of fibrous strands disposed helically with respect to the core tube, and a flexible outer polymeric sheath disposed around the reinforcement member and providing a protective cover therefor.

3,604,462
FLEXIBLE TUBING AND METHOD OF MAKING SAME
William C. Dreher, San Jose, and Duncan B. Ross, Santa Clara, both of, Calif., assignors to Owens-Corning Fiberglas Corporation
Filed Sept. 14, 1966, Ser. No. 579,380
Int. Cl. F16l *11/08*
U.S. Cl. 138—139 **8 Claims**



A dimensionally stable helical coil is nested in an unstressed state inside a thick tubular wall of insulating material. The convolutions of the coil are spaced apart a distance in the range of two-thirds to 1½ of the thickness of the wall. The wall preferably is formed by depositing a layer of glass fibers and binder adjacent a glass fiber fabric and curing the binder to integrate the fibers into a mat and to adhere the fabric to the mat to form an inner facing for the wall.

3,604,463
WEAR-RESISTANT TUBE
Jack Lowrie McLarty, Millwaukee, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed July 29, 1969, Ser. No. 845,880
Int. Cl. F16l *9/12*
U.S. Cl. 138—144 **6 Claims**



A wear-resistant tube and the method of manufacture thereof. A tube is produced having an interior gel coat layer

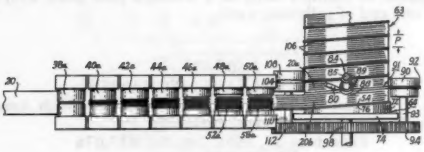
containing a first thermosetting resin system within which particles of mica are dispersed. Fiberglass filaments coated within a second thermosetting resin system are overwound about this interior layer to form an exterior layer. The interior and exterior layers are bounded to each other and together form a wear-resistant tube.

3,604,464

BENDABLE METAL DUCT

Richard B. Pelley, East Kingston, N.H., and Norman Peltier, Amesbury, Mass., assignors to Callahan Mining Corporation, New York, N.Y.

Filed Nov. 4, 1968, Ser. No. 773,061
Int. Cl. F16l 9/16; B21c 37/12; B21f 35/02
U.S. Cl. 138—154 **4 Claims**



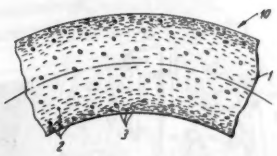
The disclosed bendable metal duct is capable of being formed into sharp bends without rupture of the duct seams. Metal strip, which has been corrugated substantially in the direction of its longitudinal axis to provide flexibility in the finished duct, is helically wound into tubular shape. The duct convolutions are joined by a lock seam which is secured by crimps disposed along the length of the seam at an acute angle to the longitudinal axis thereof. Each crimp carries through the layers of the seam to form a series of detents engaging between said layers to prevent slippage and seam rupture upon the application of bending stresses to the duct. The apparatus for automatically and continuously forming the bendable metal duct includes rollers for corrugating the strip, and a forming head on which the strip is helically wound. It also includes means for forming the lock seam comprising a crimping wheel having gearlike teeth for crimping the seam, and a press wheel to insure that the crimped seam lies flat and that the detents thereof properly engage.

3,604,465

PIPE CONSTRUCTION

Rudolf Schetty, Basel, Switzerland, assignor to Basler Stuckfarberei AG, Badenstrasse, Basel, Switzerland

Filed Mar. 6, 1968, Ser. No. 710,850
Claims priority, application Switzerland, Mar. 22, 1967, 4329/67
Int. Cl. F16l 9/12
U.S. Cl. 138—177 **8 Claims**



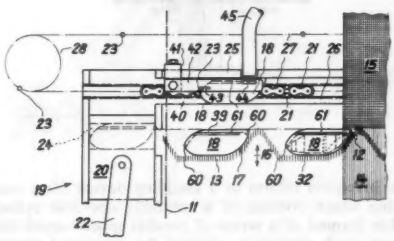
A pipe construction includes a plastic bonded filling material wherein at least one constituent of the filling material is varied in amount in a radial direction over at least a part of the pipe wall thickness. The pipe is made by supplying a filling material to a rotating mold in successive strokes along the mold axis in addition to a plastic material which is supplied continuously to the mold; and varying at least one constituent of the filling material during at least some of successive strokes as the wall thickness of the pipe is being formed.

3,604,466

APPARATUS AND METHOD FOR CLEANING A SHUTTLE ON A LOOM

Edgar H. Strauss, Ruti/ZH, and Gerd Hugo Rabe, Tann-Ruti/ZH, both of, Switzerland, assignors to Ruti Machinery Works, Ltd., formerly Caspar Honegger, Ruti, Switzerland

Filed Sept. 4, 1969, Ser. No. 855,097
Claims priority, application Switzerland, Sept. 20, 1968, 14153/68
Int. Cl. D03d 47/26
U.S. Cl. 139—12 **17 Claims**



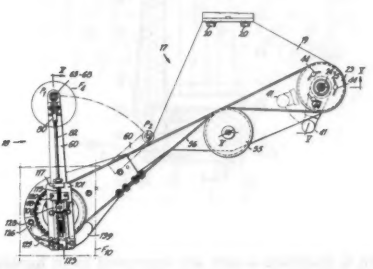
An apparatus for cleaning a shuttle on a loom wherein the shuttle moves along a path to successively insert individual weft threads into the sheds formed during the weaving operation, which comprises cleaning means located at a point along the path of the shuttle for effecting periodic cleaning of a zone of the shuttle that requires cleaning, each time the shuttle is at this location. A method of cleaning the shuttle is also disclosed.

3,604,467

WEFT NIPPER FOR CIRCULAR LOOM

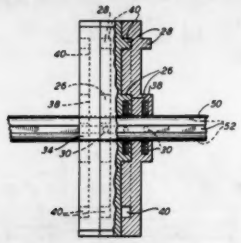
Armand Malchair, Herstal, Belgium, assignor to Peltzer & Fils S.A. societe anonyme, Verviers, Belgium

Filed May 26, 1969, Ser. No. 827,588
Claims priority, application Belgium, May 30, 1968, 715850
Int. Cl. D03d 37/00
U.S. Cl. 139—13 **5 Claims**



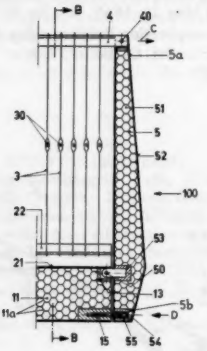
Weft nipper for a circular loom comprising an oscillating arm overhanging the path of the weft-drawing devices, said oscillating arm carrying, at its end, a gripping means actuated through a scissors device carried by said oscillating arm, by a rod fixed to a slide contacting an oscillating cam pivoted on a fixed support.

3,604,468
SHEDDING DEVICE FOR WEAVING MACHINE
Geza J. Sajo, and Agnes Sajo, both of Montreal, Quebec, Canada, assignors to The Sajo Corporation, Montreal, Quebec, Canada
Filed Dec. 18, 1968, Ser. No. 784,602
Int. Cl. D03c *13/00*
U.S. Cl. 139—55 **1 Claim**



The invention relates to a shedding device for a weaving machine which consists of a rotatably operable cylindrical member formed of a series of parallel spaced-apart disclike sections; each section is adapted for rotational movement about a longitudinal axis and is provided with warp lifting portions extending for a predetermined arc about the axis. The disclike sections may be assembled on the axle in a variety of combinations in order to produce a great variety of patterns.

3,604,469
LOOM HARNESS
Hanspeter Schneiter, Kloten, and Karl Kotachka, Zurich, both of, Switzerland, assignors to Contraves AG, Zurich, Switzerland
Filed Nov. 4, 1968, Ser. No. 773,021
Claims priority, application Switzerland, Nov. 17, 1967, Sept. 17, 1968, 16127/67;13899/68
Int. Cl. D03c *9/06*
U.S. Cl. 139—91 **1 Claim**

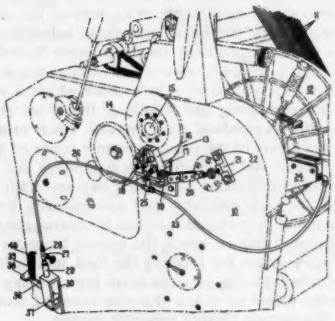


There is disclosed a new and improved loom harness construction comprising a harness frame incorporating a harness beam and a pair of side struts. According to one aspect of the invention the harness beam and, if desired, also the side struts are constructed as respective substantially lightweight composite body members with cellular core and therewith substantially flushly connected shell means. Furthermore there is provided a pair of substantially parallel and spaced heddle support rails carried by the harness frame. The aforesaid pair of side struts extend substantially perpendicular to the ends of the harness beam. One of the heddle support rails is detachably mounted between the free ends of the side struts, and the invention further contemplates the provision of means for applying a lengthwise directed tensional force to the one detachably mounted heddle support rail. The other heddle support rail is inserted at the harness frame near to the bottom or lower region of the side struts.

3,604,470
DURABLE-PRESS STRETCH FABRIC AND METHOD OF OBTAINING SAME
Paul Zindwer, New York, N.Y., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Mar. 7, 1969, Ser. No. 805,368
Int. Cl. D03d *15/08*
U.S. Cl. 139—421 **7 Claims**

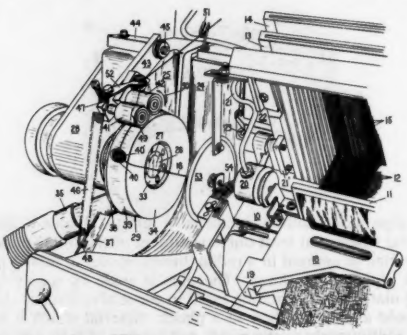
A durable press woven stretch fabric including a durable pressure finish and comprising, as the filling, a plied yarn composed of multiple ends of a textured yarn plied with at least one end of cellulosic yarn.

3,604,471
LETOFF RELEASE MECHANISM
John H. Nydam, Whitnsville, Mass., assignor to North American Rockwell Corporation, Pittsburgh, Pa.
Filed June 27, 1969, Ser. No. 837,076
Int. Cl. D03c *49/06*
U.S. Cl. 139—100 **4 Claims**



A selective release mechanism for the braking device of a loom letoff for relieving the restraining forces normally applied to the yarn beam while drawing the warp yarns therefrom.

3,604,472
FILLING STORAGE DEVICE FOR LOOMS
John H. Nydam, Whitinsville, Mass., assignor to North American Rockwell Corporation, Pittsburgh, Pa.
Filed Dec. 22, 1969, Ser. No. 1,902
Int. Cl. D03d *47/34*
U.S. Cl. 139—122 R **5 Claims**



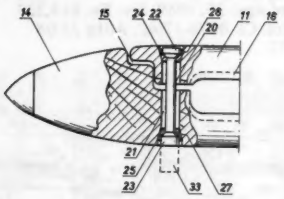
A filling storage device for looms of the type adapted to insert lengths of filling into sheds formed by warp threads, said

device having a rotating drum member on which a premeasured length of filling is to be wound and held in contact therewith by a vacuum prior to its insertion into a warp shed.

3,604,473
WEAVING SHUTTLE

Johann Heinrich Butikofer, Tann-Ruti, Zurich, Switzerland, assignor to Ruti Machinery Works Ltd., formerly Caspar Honegger, Ruti, Switzerland

Filed Oct. 1, 1969, Ser. No. 862,808
Claims priority, application Switzerland, Oct. 23, 1968, 015807/68
Int. Cl. D03j *5/16*
U.S. Cl. 139—207 **10 Claims**

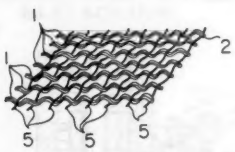


A weaving shuttle comprising an elongated body having two sidewalls interconnected at one end and separated at the other end of the shuttle and having an opening extending through the sidewalls separated at the other end, a bobbin located within the body between said sidewalls, retaining means for retaining the head of the bobbin being carried by the separated sidewalls, and an elastic strip extending under tension through the opening. The opening has widened portions at its outer ends and the elastic strip has thickened portions at each end. The thickened portions bear against the widened portions of said opening so that the sidewalls are biased towards each other by the tensioned strip.

3,604,474
SCRUBBING BATH TOWEL

Haruo Kamei, 1-161 Sakasai Edogawaku, Tokyo, Japan

Filed Apr. 22, 1969, Ser. No. 818,213
Int. Cl. D03d *15/00, 27/108;* **D06c** *1/00*
U.S. Cl. 139—420 **2 Claims**

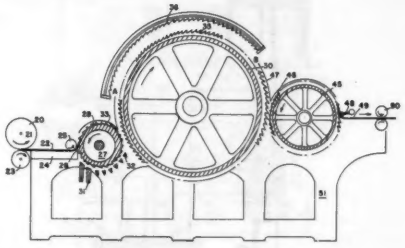


A bath towel suitable for scrubbing and cleaning the human body made of weftwisely creped fabric comprising thermoplastic crimped multifilament yarn as a weft and thermoplastic filament yarn as a warp, and method of making the same comprising a treatment in a hot water bath in which the fabric of the towel is given agitation through the hot water by a means to agitate.

3,604,475
METHOD OF APPLYING CARD CLOTHING AND THE LIKE TO A CONCAVE

John D. Hollingsworth, P.O. Box 516, Greenville, S.C.

Division of Ser. No. 869,300, Oct. 24, 1969, abandoned, which is a continuation-in-part of application Ser. No. 793,715, Jan. 24, 1969, now abandoned, which is a continuation-in-part of application Ser. No. 729,068, May 14, 1969, now abandoned. Divided and this application Apr. 2, 1971, Ser. No. 130,648
Int. Cl. B21f *45/10*
U.S. Cl. 140—97 **12 Claims**

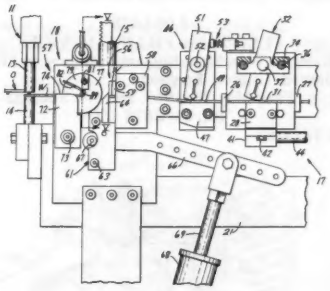


A concave metallic surface suitable for carding and the like is applied to a concave support by placing a predetermined concave reverse set curvature in a band of wire so that teeth on a side of the band opposite a base of the band face inwardly, cutting a plurality of concave segments from said band, positioning the concave segments in adjacent rows in alignment on the concave support with the teeth facing inwardly away from the support, and fastening the segments on the support as by clamping.

3,604,476
HOOK APPLYING MACHINE

John W. Black, Prairieville Township, Barry County, Mich., assignor to Pemco Wheel Company, Kalamazoo, Mich.

Filed Nov. 3, 1969, Ser. No. 873,209
Int. Cl. B21f *15/08, 27/14*
U.S. Cl. 140—112 **6 Claims**



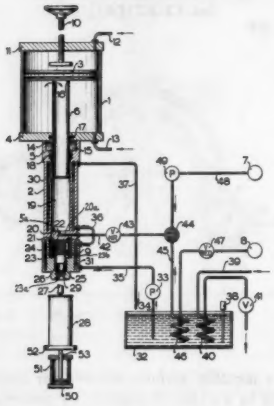
A pair of elongated, spaced wires are simultaneously advanced into positions where the free ends of the wires are disposed respectively between two pairs of welding electrodes. Both wires are severed at points spaced from the free ends thereof and the wires are bent to form hooks. An object, such as one edge of a wire rack, is also positioned between the pairs of welding electrodes, after which the electrodes are driven into engagement with the object and the free ends of the wire hooks to weld them to the object.

3,604,477

APPARATUS FOR FILING AEROSOL PACKAGES

Hans Grothoff, Am Krabben 7, 58911 Valbert, Germany

Filed Feb. 13, 1969, Ser. No. 798,884
Claims priority, application Germany, Feb. 13, 1968, P 16 01 260.5
Int. Cl. B65b 31/06
U.S. Cl. 141—20 21 Claims



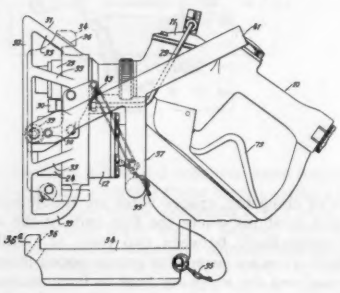
The metering cylinder of an apparatus for admitting gaseous or liquefied propellant into aerosol packages accommodates a reciprocable plunger which is hollow and is connected to the piston of a pneumatic cylinder. The metering cylinder is separably connected with a filling head and is provided with an internal annular space for lubricant which surrounds a portion of the plunger. The filling head and the metering cylinder are provided with jackets for circulating conditioning fluid which withdraws heat developing on compression of gaseous propellant. The space for lubricant is flanked by two annular seals which are respectively installed in the metering cylinder and in the pneumatic cylinder. The inlet of the metering cylinder can receive gaseous or liquefied propellant, depending on the setting of a three-way valve which is installed in a conduit containing a pump for liquefied propellant and a valve which regulates the pressure of gaseous propellant.

3,604,478

FUEL-TANK-FILLING DEVICES

Frank Gowens, Wareham, England, assignor to Flight Refueling Limited, London, England

Filed May 20, 1969, Ser. No. 826,132
Int. Cl. B67d 5/371
U.S. Cl. 141—59 15 Claims



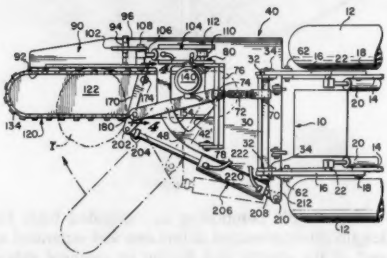
A fuel-tank-filling device including a coupling element comprising a hosecock **10** connected to a fuel supply hose and to a vent hose **16**, a manually opened and spring closed valve in the hosecock **10** to shut off the supply of fuel, a head member **12** for coupling with a receiving unit mounted on the vehicle, passages **13, 14** in the head member **12** communicating with the hoses, spring-loaded valves closing the passages **13, 14** and arranged for automatic opening simultaneously with the operation of a spring-released manually operated latch **37** which is held manually against the action of the spring release to hold the head member **12** in engagement with the receiving unit, corresponding spring-loaded valves which close corresponding passages in the receiving unit also being opened by the action of coupling the coupling element with the receiving unit.

3,604,479

CHAIN SAW TREE-FELLING APPARATUS

Bertram L. Jordan, Lewiston, N.C., assignor to Harrington Manufacturing Company, Inc.

Filed Apr. 25, 1969, Ser. No. 819,237
Int. Cl. B27b 17/02; A01g 23/08
U.S. Cl. 143—32 1 Claim



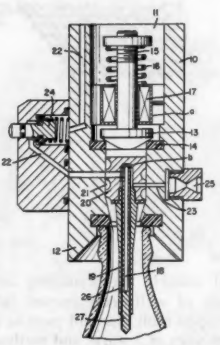
The present invention pertains to a tree-felling device that is adapted to be mounted on the front of a vehicle and that incorporates a pivotally mounted chain saw. The chain saw is associated with means for assisting the directional felling of the tree.

3,604,480

FILLING ELEMENT FOR COUNTERPRESSURE FILLING MACHINES

Hans Reichert, Rehborn, and Alfred Rentel, Winzenheim, both of, Germany, assignors to Seitz-Werke G.m.b.H, Bad Kreuznach, Rineland, Germany

Filed July 15, 1968, Ser. No. 744,882
Claims priority, application Germany, July 22, 1967, S110959 III/64b
Int. Cl. B67c 3/06
U.S. Cl. 141—39 9 Claims



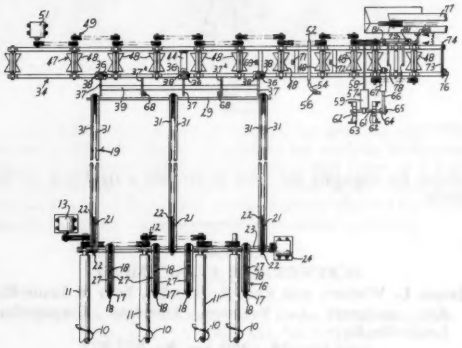
A filling unit for counterpressure container-filling machines with loading and return gas conveying tube means

and with an electromagnetically controllable liquid control valve, in which the liquid control valve has a shaft surrounded by electromagnetic means, and in which the tube means comprises two coaxially arranged tubular members electrically insulated from each other and respectively provided with contact members adapted to be interconnected by liquid in the container being filled at the end of the filling operation to thereby close the energizing circuit for the electromagnetic means to cause the latter to stop further supply of filling liquid to the container.

3,604,481
LOG SLASHER

Marvin C. Dobbs, Fayette, Ala., assignor to The Dobbs Co. and Alco Machine Shops, Incorporated, part interest to each

Filed Aug. 6, 1969, Ser. No. 847,887
Int. Cl. B27b *25/00, 31/00*
U.S. Cl. 143—32 **1 Claim**

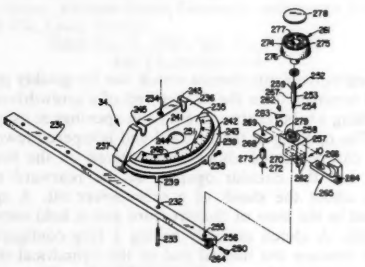


A log slasher having first conveyor delivering logs transversely of lengths to second conveyor which moves logs longitudinally of lengths. Transfer unit moves logs sequentially from first conveyor to second conveyor in response to predetermined movement of each preceding log. Washer and cutter assembly actuated in response to movement of each log to wash and then cut logs into predetermined lengths whereupon cut lengths then removed from second conveyor.

3,604,482
SAW TABLE GAGE

Edward C. Warrick, Pittsburgh, Pa., and Emerson Berends, Tupelo, Miss., assignors to Rockwell Manufacturing Company, Pittsburgh, Pa.

Division of Ser. No. 684,437, Nov. 20, 1967, Pat. No. 3,538,964
Filed Nov. 21, 1969, Ser. No. 871,365
Int. Cl. B27b *27/06*
U.S. Cl. 143—169 **4 Claims**

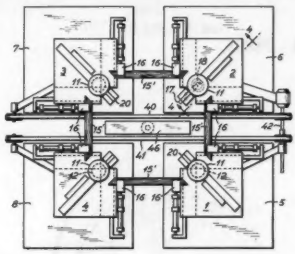


A tilting arbor table saw angle or mitre gage with adjustment controls and angle scale grouped and arranged for operation and viewing by an operator standing in operating position at the front of the saw.

3,604,483
MACHINE FOR AUTOMATICALLY PRODUCING FRAMELIKE STRUCTURES

Richard Bent Nissen, 8870 Langa, Denmark

Filed May 2, 1969, Ser. No. 821,286
Claims priority, application Denmark, May 3, 1968, May 3, 1968, 2054/68;2055/68
Int. Cl. B27m *3/00*
U.S. Cl. 144—3 **9 Claims**

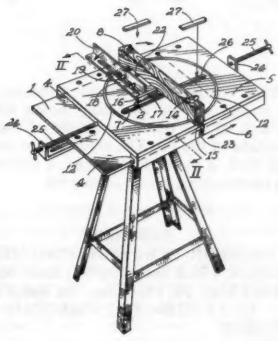


A machine for automatically producing rectangular frames or the like from previously cut to size frame components. The machine includes a number of adjustably positioned units corresponding in number to the number of frame components, and each unit carries a pair of slideably mounted clamping members disposed at an angle with each other and adapted to engage the ends of adjacent frame components. A finger cutter is also carried on each unit and is slideably mounted to move in a path which bisects the paths of the two clamping members. A hydraulic system is provided for selectively displacing the clamping members and finger cutter such that interengaging fingers are cut in the adjacent component ends as the components are displaced toward each other to form the completed frame. Means may also be provided for positioning a panel such as a glass windowpane intermediate the components such that the panel may be mounted in precut grooves in the components during the assembly operation.

3,604,484
WOOD-WORKING MACHINES WITH VERTICAL SPINDLE

Cornelius J. Viljoen, Alberton, Transvaal, Republic of South Africa, assignor to Reliance Export Company (Proprietary) Limited

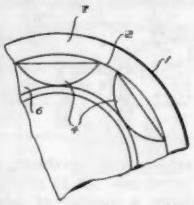
Filed Apr. 24, 1969, Ser. No. 818,950
Claims priority, application South Africa, Apr. 29, 1969, Oct. 11, 1969, 68/6585;68/2709
Int. Cl. B27f *1/04;* **B27c** *5/00*
U.S. Cl. 144—133 **3 Claims**



A woodworking machine which is more adaptable for different operations on the workpiece. A tool bit extends verti-

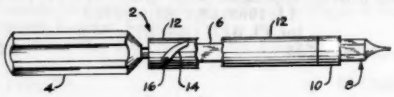
cally through the table and turns about an axis substantially vertical to the table plane. To facilitate operations on the workpiece the table consists of two plates, the top plate being slidable in reciprocating fashion over the bottom plate, and mounted on the top plate are two fences which are adjustable relative to each other and the tool bit.

3,604,485
TIRE-HOLDING DEVICE
Wilheim Schelkmann, Witten (Ruhr), Germany, assignor to Vakuum Vulk Holdings Ltd., Nassau, Bahamas
Filed Aug. 26, 1968, Ser. No. 755,150
Claims priority, application Germany, Sept. 1, 1967, Sch 41 248
Int. Cl. B29b *17/00*
U.S. Cl. 144—288 A **5 Claims**



A device for holding vehicle tires having a bead. The device includes a disc-shaped mounting member on which the tire is to be mounted, and this mounting member is provided with a substantially frustoconical projecting portion over which the tire bead is to be placed. The projecting portion has an external circumferential frustoconically tapering surface against which the bead is to abut and this surface is provided with a plurality of circumferentially distributed facets.

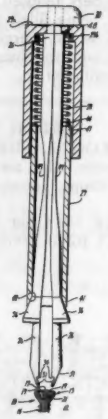
3,604,486
SCREWDRIVER
Roger D. Henry, Miami, Fla., assignor to Eugene F. Malin, Fort Lauderdale, Fla., a part interest
Filed Mar. 13, 1969, Ser. No. 806,794
Int. Cl. B25b *15/02*
U.S. Cl. 145—50 **7 Claims**



A screwdriver providing a rigid torsional connection between the handle and bit including means for varying the relative positions of the main centerline of the screwdriver and the centerline of the bit. The screwdriver includes a handle, a central shaft, a movable member, a universal connecting means, a bit-receiving chuck, and a bit.

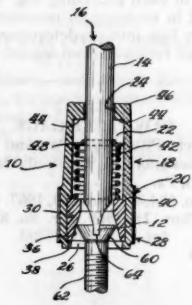
3,604,487
ORTHOPEDIC SCREW DRIVING MEANS
Richard S. Gilbert, 170 B Sotoyome St., Santa Rosa, Calif.
Filed Mar. 10, 1969, Ser. No. 805,572
Int. Cl. B25b *15/02*; **F16b** *23/00*
U.S. Cl. 145—50 D **4 Claims**

A combination of an orthopedic screw and driving means which enables the screw to be started and driven in a single continuous operation with one hand. The screwhead has multiple slots, and the driving means has multiple pinching



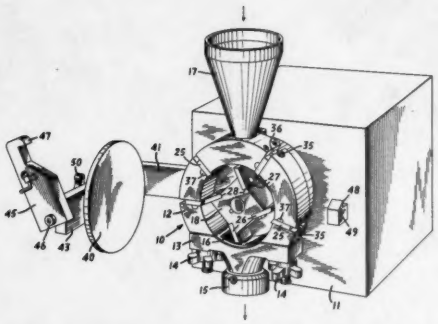
blades for engaging the slots to provide a rigid grip of the screw.

3,604,488
SCREWDRIVER ATTACHMENT
James L. Wishart, and Paul R. Blondin, both of Louisville, Ky., assignors to Vermont American Corporation, Louisville, Ky.
Filed Nov. 19, 1969, Ser. No. 877,894
Int. Cl. B25b *23/08*
U.S. Cl. 145—51 **4 Claims**



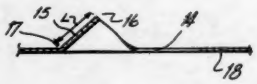
A screwdriver attachment which can be quickly mounted on and removed from the driving end of a screwdriver shank comprising a tubular structure having openings at its opposite ends. The opening at the forward end is tapered inwardly so that it can be seated about and centered on the head of a screw, and the circular opening at the rearward end fits loosely about the shank of a screwdriver bit. A spring is disposed in the bore of the structure and is held between its two ends. A clutch member having a ring configuration is placed between the inward end of the cylindrical structure and the spring and has a plurality of resilient fingers extending from its inner surface towards the rearward end to provide a slip clutch engagement with the shank of the screwdriver bit.

3,604,489
GRINDING MILL
Tibor S. Laszlo, Richmond, Va., and Henry M. Stahr, Ames, Iowa, assignors to Philip Morris Incorporated, New York, N.Y.
Filed Dec. 23, 1969, Ser. No. 887,489
Int. Cl. A24b *3/00*
U.S. Cl. 146—123 8 Claims



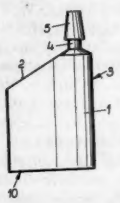
A grinding mill of a type adapted for grinding vegetable material such as samples of tobacco for analysis having the internal operating parts coated with a thin layer of a high temperature refractory metal compound highly resistant to abrasion and to adherence of the material thereto the compound being applied to the parts by cathodic sputtering.

3,604,490
SHREDDER PLATE
Melvin E. Bricker, 2723 Saddleback Drive, Cincinnati, Ohio
Filed Nov. 12, 1969, Ser. No. 875,806
Int. Cl. B02c *19/20*
U.S. Cl. 146—177 3 Claims



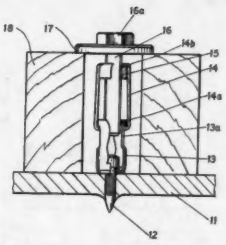
A shredder plate for use with high-speed rotary vegetable cutter drives. The shredder plate includes a plurality of cutter openings and adjacent cutter flanges. Each cutter flange is arcuate and terminates in a cutting edge forming a continuation of the periphery of the adjacent opening. The flanges taper from a maximum width at the cutting edge to an apex. The length of the flange along the centerline is approximately equal to one-half of the diameter of the opening and the centerline of the flange makes an angle of approximately 40° with the plate.

3,604,491
FLEXIBLE DRINKING CONTAINER OR BAG
Dieter Spiess, Kleinkarlbach, Germany, assignor to Thimonnier & Cie, Lyon, France
Filed Dec. 9, 1968, Ser. No. 872,368
Int. Cl. B65d *31/16*
U.S. Cl. 150—8 14 Claims



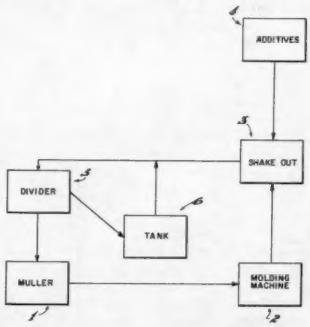
A flexible drinking container or bag which comprises a tubular wall member with a top portion converging toward a capped dispensing opening and a bottom portion suitably shaped to support a filled container in an upright standing position.

3,604,492
FASTENING ELEMENT
Wolfgang Bayer, Eschen, Pons, Liechtenstein, assignor to Hilti Aktiengesellschaft, Schaan, Furstentum, Liechtenstein
Filed May 22, 1969, Ser. No. 826,906
Claims priority, application Germany, June 14, 1968, H62999
Int. Cl. E04b *1/38;* F16b *39/00*
U.S. Cl. 151—41.73 6 Claims



A fastening element for the flexible fastening of a part to a base includes an anchoring element such as a nail which is adapted to be power driven into the base and a coupling part having detents at one end which engage around coupling detents of the nailhead and an opposite end which is secured to a nut. The nut provides a threaded receptacle for a threaded bolt which is adapted to bear either directly or through a washer upon the part to be fastened.

3,604,493
METHOD FOR HANDLING AND COOLING FOUNDRY SAND
Joseph S. Schumacher, 7256 Concord Ridge Drive, Cincinnati, Ohio
Continuation-in-part of application Ser. No. 714,339, Mar. 19, 1968, now Patent No. 3,461,941. This application July 7, 1969, Ser. No. 839,339
Int. Cl. B22c *5/16*
U.S. Cl. 164—5 3 Claims



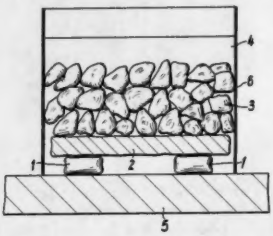
The invention disclosed herein relates to a novel method of handling and cooling foundry sand. The method includes the steps of preparing a quantity of the foundry sand, conveying a portion of the sand to a molding machine and forming molds therefrom, casting a metal into the molds, breaking up the molds, and mixing the unused sand with the used sand. Only a portion of the used-unused sand mixture is subsequently mulled, the remainder being retained in a storage tank for subsequent cooling. By using this method, the temperature of the foundry sand can be controlled and the use of costly cooling apparatus can be eliminated.

3,604,494

PROCESS FOR THE PRODUCTION OF COMPOSITE INGOTS OF MAGNESIUM CONTAINING PREALLOYS

Heiner Trager, Neu Isenburg; Albert Kaune, Frankfurt; Horst Muhlberger, Frankfurt; Karl Josef Reifferscheid, Petterweil; Ludwig Grimm, Hart (Alz); Gerhard Wagner, Unterneukirchen-Hart, and Heinrich Haslinger, Garching (Alz), all of, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt/Main 1,, Germany and Suddeutsche Kalkstick-stopfwerke A.G., Trostbert, Germany

Filed Oct. 2, 1967, Ser. No. 672,163
Claims priority, application Germany, Oct. 4, 1966, Sept. 15, 1967, M 71156;M 75554
Int. Cl. B22d *19/00*; C22c *23/00*
U.S. Cl. 164—97 8 Claims



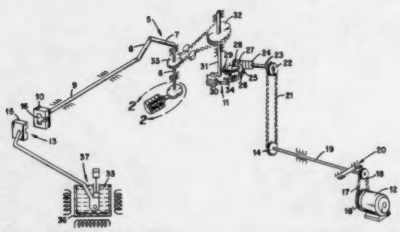
Compact, magnesium containing prealloy ingots are produced by casting a molten magnesium containing prealloy around prefabricated solid pieces of a prealloy having the same or similar composition as that of the molten prealloy. The resulting compact prealloy ingots are used in the production of cast iron with spheroidal graphite.

3,604,495

METHOD OF MAINTAINING DIECASTING RECIPROCATION APPARATUS IN FORCE-BALANCED STATE

Franck M. Picker, Oak Ridge, Tenn., assignor to Pic-Air Inc., Oak Ridge, Tenn.

Filed Dec. 4, 1969, Ser. No. 882,020
Int. Cl. B22d *27/10*
U.S. Cl. 164—113 1 Claim



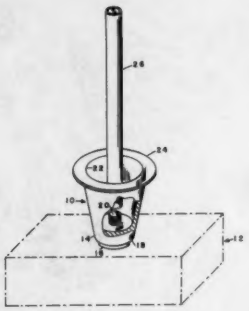
In a method for diecasting molten metal employing a split die, one platen of which is fixed and one platen of which is reciprocatable between open and closed positions, the improved step of maintaining the platen reciprocation apparatus in a force-balanced state during a major part of such reciprocation cycle.

3,604,496

SPRUE FORMING PATTERN

Milton O. Grosjean, Los Angeles, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 28, 1969, Ser. No. 812,581
Int. Cl. B22c *7/00*
U.S. Cl. 164—244 2 Claims



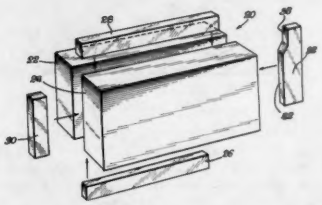
A reusable cup-shaped sprue forming pattern to support a disposable investment casting pattern or pattern assembly.

3,604,497

MOLD APPARATUS FOR CASTING MOLTEN METAL

Edmund Q. Sylvester, c/o Sylvester Enterprises, Inc. 850 Hanna Bldg., Cleveland, Ohio

Filed Feb. 16, 1966, Ser. No. 527,699
Int. Cl. B22d *47/00*, *33/04*
U.S. Cl. 164—269 25 Claims



A series of molds, each having a casting cavity defined by a plurality of movable mold blocks, are positionable to be successively filled with molten metal from a movable ladle. After the metal in each mold solidifies, the mold blocks are moved and the enclosed casting is transported to another location for processing. Cleaning and coating apparatuses are provided to recondition the mold blocks after each pour. The reconditioned blocks are then repositioned to define a casting cavity and moved into a pouring location to be again filled with molten metal.

3,604,498

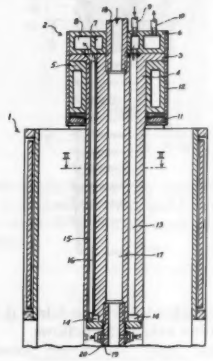
CONTINUOUS CASTING MOLD WITH CORRUGATED SURFACE MANDREL

Georg Bollig, Buederich, Germany, assignor to Schloemann Aktiengesellschaft, Duesseldorf, Germany

Filed Jan. 14, 1970, Ser. No. 2,879
Int. Cl. B22d *11/02*
U.S. Cl. 164—283 6 Claims

Apparatus for continuously casting tubes consists of a cooled mandrel extending into a continuous casting mold. The portion of the surface of the mandrel extending into the mold has longitudinal depressions therein substantially parallel to the longitudinal axis of the mandrel. In a preferred form, the depressions are spaced around the mandrel forming a corrugated surface with regular and equally curved ridges

and hollows. Cooling channels are preferably provided in the ridges between the depressions. Jets are preferably provided



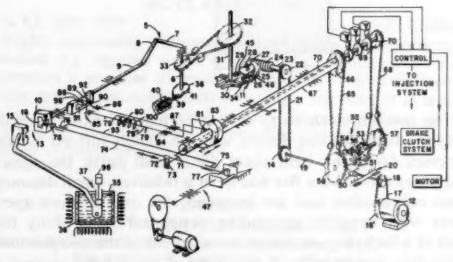
at the end of the mandrel for applying coolant to the interior of a tube formed by the mandrel. The mandrel may also be conical in the direction of tube travel.

3,604,499

DIECASTING MACHINE WITH FORCE-BALANCED RECIPROCATION APPARATUS AND TRANSFERRING MEANS

Franck M. Picker, Oak Ridge, Tenn., assignor to Pic-Air Inc., Oak Ridge, Tenn.

Filed Dec. 4, 1969, Ser. No. 882,021
Int. Cl. B22d *17/00, 17/24, 33/04*
U.S. Cl. 164—303 **9 Claims**



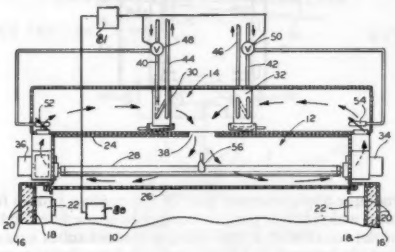
A fast-acting diecasting machine including in combination, a die having at least one die platen which is reciprocatable between open and closed positions, a prime mover, reciprocation means disposed between said movable die platen and said prime mover for selectively and intermittently reciprocating said movable die platen between open and closed positions, transfer means for moving castings from said die cooperatively connected to said reciprocation means, means selectively and intermittently connecting said transfer means to said prime mover, means maintaining said reciprocation apparatus in a substantially force-balanced state during at least a major part of a platen reciprocation cycle, and means for injecting liquid matter into the die when it is closed. There is also disclosed a novel method for die casting.

3,604,500

METHOD OF CONTROLLING FLUORESCENT LAMP OUTPUT

Noel Davis, c/o Integrated Dev. and Manufacturing Co., 510 East Washington St., Chagin Falls, Ohio, assignor to Integrated Development and Manufacturing Co., Chagrin Falls, Ohio

Filed Apr. 7, 1970, Ser. No. 26,357
Int. Cl. F28
U.S. Cl. 165—1 **8 Claims**



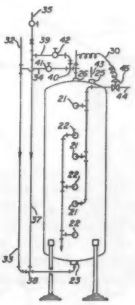
A method and apparatus for controlling the output of the fluorescent lamps in an environmental growth chamber to produce uniform or predetermined light levels within chambers of the type including means for conducting cooling air across the lamps. A temperature for the air is selected which is different than the temperature at which maximum light output occurs from the lamps and which corresponds to a desired light output. At at least periodic intervals thereafter, the light output from the lamps is measured and if by light sensitive means the output is above or below that desired, the cooling air temperature is manually or automatically adjusted to bring the output to the desired level.

3,604,501

HEAT EXCHANGER

Henry Brants, 444 Sanford Ave., St. Lambert, Quebec, Canada

Filed Oct. 28, 1969, Ser. No. 871,928
Claims priority, application Canada, Dec. 18, 1968, 038,193
Int. Cl. G05d *23/00;* **B60h** *1/00;* **F28f** *13/06*
U.S. Cl. 165—1 **6 Claims**

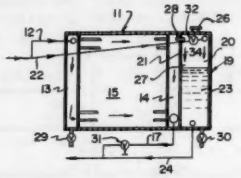


A heat exchanger which is used to reheat a recirculated heating fluid in which most of the recycled fluid and most of the makeup fluid is mixed outside of the heat exchanger and fed to the heat exchanger via a bottom inlet. A small proportion of the recycled fluid and a small proportion of the makeup fluid is mixed outside of the heat exchanger and fed to an inlet at the top of the heat exchanger. This second flow of fluid passes through a control chamber mounted inside the heat exchanger to permit the temperature of this flow to be sensed by a temperature controller, which regulates the heat input to the heat exchanger.

3,604,502
COOLANT DEAERATION SYSTEM FOR INTERNAL COMBUSTION ENGINE COOLED BY CROSSFLOW RADIATOR

James D. Morse, and Robert C. Verhaeghe, both of Racine, Wis., assignors to Modine Manufacturing Company

Filed Sept. 4, 1969, Ser. No. 855,151
Int. Cl. F01p *11/02*
U.S. Cl. 165—51 6 Claims

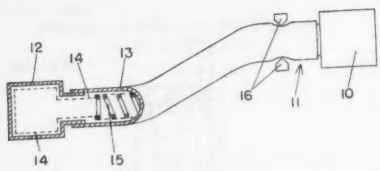


A radiator apparatus as a part of the cooling system for an engine in which the apparatus comprises spaced vertical inlet and outlet tanks with a core having coolant tubes extending horizontally between the tanks (such radiator being termed a "crossflow radiator"), a first coolant conduit from the engine to a first of the tanks, a second coolant conduit from the second of the tanks to the engine so that the coolant flows from the engine to one tank or header and through the tubes to the other tank or header and then back to the engine, a coolant reserve and deaerating third vertical tank having a coolant liquid level when in use intermediate the top and bottom of this third tank, an inlet line for the coolant and entrapped gases from the engine to this third tank, a coolant outlet line for coolant substantially free of entrapped gases from the third tank to the engine and a check valve in the coolant inlet line permitting fluid flow only toward the third tank.

3,604,503
HEAT PIPES

Karl T. Feldman, Jr., and John D. Kusianovich, both of Bernalillo, N. Mex., assignors to Energy Conversion Systems, Inc., Albuquerque, N. Mex.

Filed Aug. 2, 1968, Ser. No. 749,697
Int. Cl. F28f *27/00*; F28d *15/00*
U.S. Cl. 165—96 1 Claim



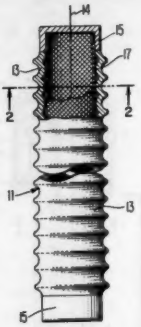
An improved heat pipe having an evaporator and a condenser connected together by a flexible heat transfer tube lined with a wick, with a clamping means connected to the outer circumference of the flexible heat transfer pipe for reducing the circumference thereof to thereby restrict the transfer of vaporized heat transfer fluid from the evaporator to the condenser.

3,604,504
FLEXIBLE HEAT PIPE

Sebastian William Kessler, Jr., and James Lee Hess, both of Lancaster, Pa., assignors to RCA Corporation

Filed May 13, 1970, Ser. No. 36,972
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 10 Claims

A heat pipe comprising a flexible sealed envelope and an internal wick structure comprising two sets of cross-members in transverse relation to each other, the cross-members being transverse to the flexible axis of the envelope. The wick structure may be a cylindrical mesh screen consisting of orthogonal metal wires disposed within a cylindrical metal

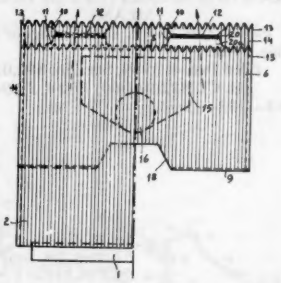


bellows such that each of the cross wires is at an angle with respect to the flexible axis of the bellows.

3,604,505
HEAT EXCHANGERS, MORE PARTICULARLY FOR AN AIR-HEATING DEVICE

Arnold Van der Goot, Voorbroek, Netherlands, assignor to Metaalwarenfabrick Joh. Th. Benraad N.V., Terborg, Netherlands

Filed Apr. 8, 1969, Ser. No. 814,403
Int. Cl. F28f *3/02*
U.S. Cl. 165—131 3 Claims



The invention relates to a heat exchanger, more particularly for an air-heating device, which is mainly formed by two reversed U-shaped bent sheet metal wall parts, the upper portions of which are flat and lie at a relatively small distance from one another and are provided with one or more apertures with opposite upstanding peripheral walls along the rims of which they are interconnected, while the two portions extending downwardly at the front of the device enclose a combustion space and the two wall portions extending downwardly at the rear enclose a space connected to the flue gas outlet with a downdraft diverter.

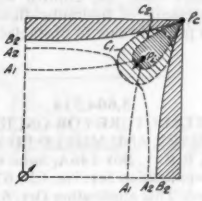
3,604,506
INTERFACE ADVANCE CONTROL IN SECONDARY RECOVERY PROGRAM BY USE OF DYNAMIC GRADIENT BARRIER AND BY RETARDING CUSP FORMATION

Donald L. Hoyt, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 786,568, Dec. 24, 1968. This application June 30, 1969, Ser. No. 837,782
Int. Cl. E21b *43/22*
U.S. Cl. 166—245 15 Claims

The advance of the interface between driving and driven fluids in a secondary recovery operation toward a production

well is delayed by the imposition of a gradient barrier of produced hydrocarbon fluids injected into the formation via a control well in line between an injection well and a production well, the recirculation of the formation hydrocarbon fluids providing a dynamic barrier, and by retarding cusp formation via wells controlling the advance of flow gradients to spread the interface.



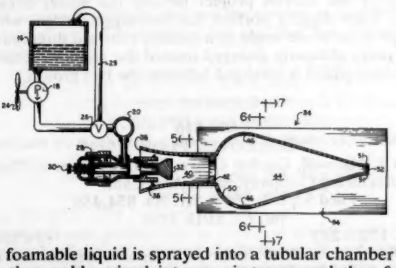
3,604,507
SINGLE WELL BACKFLOW IN SITU COMBUSTION PROCESS
Rosswell W. Thomas, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Apr. 3, 1969, Ser. No. 813,276
Int. Cl. E21b *43/24*
U.S. Cl. 166—259 **5 Claims**

A method is disclosed for producing petroleum by igniting a reservoir containing a pressurized combustion-supporting gas previously placed in said reservoir by introduction through a production well and recovering petroleum from the well. Also a method is disclosed for repeating the production method by self-ignition of the reservoir through the subsequent introduction of an additional quantity of combustion-supporting gas.

3,604,508
USE OF OIL-EXTERNAL MICELLAR DISPERSIONS AS PLUGGING AGENTS IN SUBTERRANEAN FORMATIONS
Marion O. Son, Jr., Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio
Continuation-in-part of application Ser. No. 781,593, Dec. 5, 1968, now abandoned. This application Mar. 16, 1970, Ser. No. 20,101
Int. Cl. E21b *33/138*
U.S. Cl. 166—294 **23 Claims**

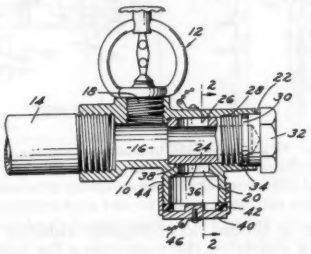
Highly permeable subterranean formations are effectively blocked, e.g. against water intrusion, by injecting into the formation a micellar dispersion comprised of hydrocarbon, surfactant and aqueous medium having a viscosity of at least about 50 cp. at ambient temperature. Cosurfactants and electrolytes are also useful in the micellar dispersion to obtain desired viscosity characteristics.

3,604,509
AIRPLANE FOAM GENERATOR
Norman H. Sachnik, 1035 Columbia, Houston, Tex.
Filed May 15, 1969, Ser. No. 824,868
Int. Cl. A62c *35/00*
U.S. Cl. 169—15 **3 Claims**



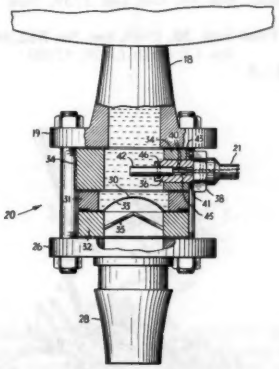
A foamable liquid is sprayed into a tubular chamber where it is thoroughly mixed into an airstream and thus foamed. From there the foam is forced into a larger chamber where it is dispersed to fall upon agricultural crops. The trailing edge of the second chamber from which the foam is discharged is readily adjustable so that the size of the globules of foam discharged is readily adjustable.

3,604,510
FLUSH HEAD FOR FIRE PROTECTION SPRINKLER SYSTEM
Peter C. Tainsh, 4461 W. Jefferson, Detroit, Mich.
Filed Nov. 30, 1967, Ser. No. 687,019
Int. Cl. A62c *35/00*
U.S. Cl. 169—16 **4 Claims**



This invention relates to flushing devices for fire protection sprinkler systems and more particularly to improvements in a flush head to be utilized with each sprinkler head at the end of main or branch lines. In this device the fluid inlet passageway is positioned at substantially a right angle to the sprinkler supply passageway to provide improved flushing characteristics for the system. A rotatably actuable valve allows the system to be flushed while maintaining fluid pressure on the sprinkler head.

3,604,511
METHOD AND APPARATUS FOR QUENCHING FIRES AND SUPPRESSING EXPLOSIONS
George L. Griffith, Coopersburg; Dominic J. Riotto, Barnesville, and William C. Altrichter, Allentown, all of, Pa., assignors to Commercial Solvents Corporation, Terre Haute, Ind.
Filed Jan. 16, 1969, Ser. No. 791,648
Int. Cl. A62c *35/08*
U.S. Cl. 169—28 **13 Claims**



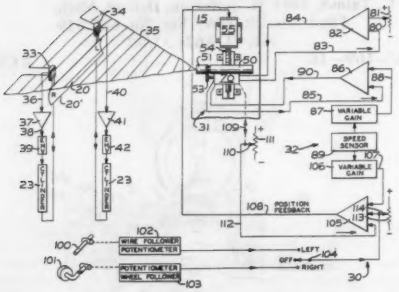
A method and apparatus for quenching fires and suppressing explosions is provided in which a deluge of fluid is released all at once onto the fire or combustion associated with the early stages of an explosion. A sensing device detects the fire or combustion and detonates a blasting cap, which detonation creates a shock wave which travels through the fluid in the vessel, to actuate a valve and release the fluid.

3,604,512

ELECTROOPTICAL CONTROL SYSTEM FOR VEHICLES

John W. Carter; James C. Barton, and Rolland D. Scholl, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 16, 1969, Ser. No. 858,432
Int. Cl. E02f *3/76*
U.S. Cl. 172—4.5 **13 Claims**



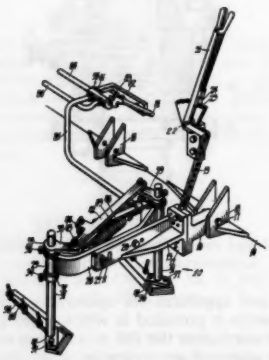
A laser or similar electromagnetic radiation with a lens system for converting the beam into a flat reference plane fanning outwardly from its source includes a vertical reference and control circuits drivingly connected to the lens system whereby the beam path can be maintained in the flat reference plane and at a preselected angle relative to true vertical as its supporting vehicle varies in attitude. The radiation source and lens system are mounted upon an earthmoving vehicle having an earthworking blade or similar tool which includes spaced apart optical sensors secured thereon which are connected to control circuits adjusting such blade or tool. These control circuits continuously adjust such blade or tool to a predetermined relationship relative to the flat reference plane of radiation, notwithstanding deflections or distortion in the machine frame. By mounting the radiation source and lens system along with its controls so that they are vertically adjustable on the vehicle, the height of the reference plane of radiation can be adjusted relative to an external reference thereby providing automatic control for a blade or tool in both slope and grade.

3,604,513

CULTIVATING IMPLEMENT HYDRAULIC CONTROL MEANS

Frank Tassone, Box 10, Gol Gol 2739, New South Wales, Australia

Filed Sept. 30, 1969, Ser. No. 862,387
Int. Cl. A01b *13/06, 65/00*
U.S. Cl. 172—5 **5 Claims**



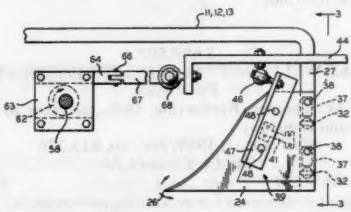
A tractor-mounted soil-cultivating implement of the type in which a cultivating element is movable from a retracted or nonworking position to a working position by operation of an hydraulic ram. The ram is supplied with hydraulic fluid from hydraulic system of the tractor via free flow control valve. In order to pressurize ram, the control valve must be held closed against pressure of hydraulic fluid so that operator feels increases in pressure due to obstacles struck by cultivating element.

3,604,514

PLOW WITH STRUCTURE FOR OSCILLATING PLOW SHARE AND MOULD BOARD

Archie R. Gagne, R.R. 1, Box 146A, Saint Charles, Ill.

Continuation of application Ser. No. 624,071, Mar. 17, 1967, now abandoned. This application Oct. 6, 1969, Ser. No. 868,967
Int. Cl. A01b *11/00*
U.S. Cl. 172—40 **1 Claim**



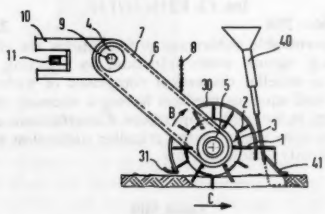
A plow for reducing the tractive effort required to move same through the soil by providing oscillating movement to the plow share and mould board.

3,604,515

DEVICE FOR CUTTING FURROWS IN THE GROUND

Konrad Kipping, Breslauer Strasse 34a, 8910 Landsberg/Lech, Germany

Filed Mar. 4, 1969, Ser. No. 804,218
Claims priority, application Germany, Mar. 5, 1968, P 16 32 772.3
Int. Cl. A01b *33/00, 35/20*
U.S. Cl. 172—60 **5 Claims**



A device for cutting furrows in the ground having a wheel rotating about a horizontal axis, and two axially spaced groups of circumferentially spaced shovels are mounted on the wheel in such a manner that radially elongated digging portions of the shovels project beyond the wheel circumference. Each digging portion has two digging edges which converge at an acute angle in a radially outward direction to form a point obliquely directed toward the plane of rotation of the wheel which is arranged between the two groups.

3,604,516

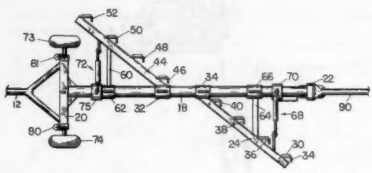
ROLLOVER PLOW

Merwin J. Maxwell, Garden Grove, Calif., assignor to Tower Manufacturing Company, Santa Ana, Calif.

Filed Sept. 2, 1969, Ser. No. 854,455
Int. Cl. A01b *3/34*
U.S. Cl. 172—223 **13 Claims**

A rollover plow whose frame includes an elongate, central, common support member held horizontally substantially in

alignment with the direction of plow action by front and rear wheeled carriages. The frame is completed by a pair of plow frame members which have pivotal connection to the support frame on a common axis in the midregion of its length and which extend obliquely, one forwardly and one rearwardly, on opposite sides of the central support frame in a substantially horizontal plane. Hydraulic actuators permit rotation of those arms over the top of the center frame to a position in the horizontal plane on the opposite side. Each of the obliquely extending plow frame members supports a series of plow pairs so that one plow of each pair extends downwardly and the other plow of each pair extends upwardly.



3,604,517

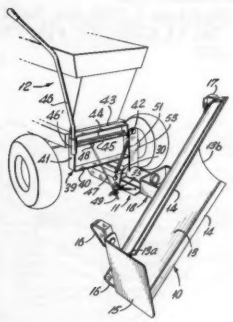
PLOW AND MEANS FOR ATTACHMENT TO A MOTOR-DRIVEN VEHICLE

Herbert B. Clifford, Michigan City, Ind., assignor to Poloron Products of Indiana, Inc., New Rochelle, N.Y.

Filed May 15, 1969, Ser. No. 824,894

Int. Cl. A01b *3/40;* **E02f** *3/76;* **E01h** *5/04*

U.S. Cl. 172—225 **10 Claims**



A plow for a motor-driven vehicle which is inclined relative to the vehicle and pivotally secured thereto, the plow and the attaching means being arranged so that when the plow is in a lowered or operating position it is automatically latched in position and upon raising the plow through a predetermined angle the latch will be automatically disengaged and the plow will rotate automatically through an angle greater than 90° so that when it is lowered it will assume the reverse position and latch in that position. The plow essentially forms a section of a cone with the smaller end leading the larger end and the smaller end of the plow is provided with a plate overlying the end and extending forwardly thereof.

3,604,518

PUSH-PULL GARDEN HOE

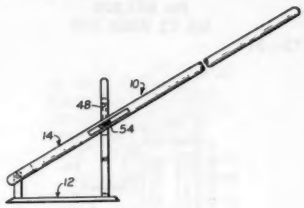
Leonard F. Buchanan, 350 Redwood Highway, Grants Pass, Oreg.

Filed June 2, 1967, Ser. No. 643,138

Int. Cl. A01b *1/08*

U.S. Cl. 172—372 **1 Claim**

A push-pull garden hoe is provided which has a blade in the form of a hollow triangle, with the inner and outer edges of each of the three triangle legs sharpened. The handle is rigidly anchored to the blade near the leading corner and near the middle of the trailing leg, with capacity for adjusting the slope of the handle relative to the blade.



The blade-anchoring means is located at substantial distances inward from the rear corners of the blade so that the rear corners are completely clear for precision hoeing immediately adjacent to a row of plants, and this without any substantial tendency to pile earth on the plants.

3,604,519

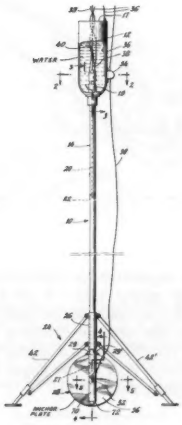
METHOD OF CREATING UNDERWATER THRUSTS TO DRIVE A MEMBER INTO THE EARTH

Stephen V. Chelminski, Valley Rd., RFD 1, West Redding, Conn.

Filed Feb. 14, 1969, Ser. No. 799,449

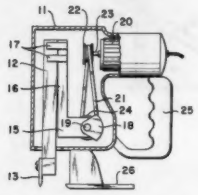
Int. Cl. E02d *7/06*

U.S. Cl. 173—1 **3 Claims**



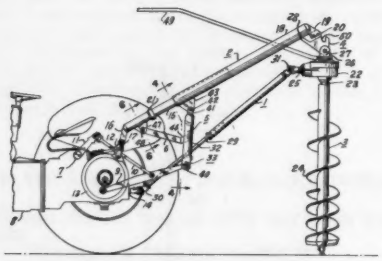
A novel thruster method and apparatus generating a sequence of powerful thrusts suitable for driving an anchor, a pile, or the like into the earth. A novel anchor, anchor placing apparatus and pile driver are described. An acoustic impulse repeater device is located within a reaction barrel to rapidly upwardly impel water therefrom. In the case of the anchor placing apparatus, the reaction of the barrel rams an anchor and the anchor chain attached to it into sediment below a body of water. In the pile driver embodiment, the pile has taken the shape of the reaction barrel into which water is placed. Various embodiments are described.

3,604,520
SONICALLY DRIVEN PAINT SCRAPER
Howard L. Shatto, Jr., 5890 La Jolla Corona Dr., La Jolla, Calif.
Continuation-in-part of application Ser. No. 695,745, Jan. 4, 1968, now abandoned. This application Sept. 11, 1969, Ser. No. 857,020
Int. Cl. B26b *7/00*
U.S. Cl. 173—31 **8 Claims**



An oscillator is coupled to a scraping blade by means of nonlinear resonant transmission means which is effective to convert sinusoidal oscillations from the oscillator into substantially unidirectional impulses at the scraper blade.

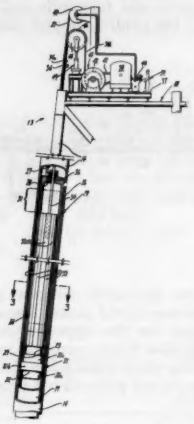
3,604,521
EARTH BORING APPARATUS
Johnnie C. Collins, Dallas, Tex., assignor to Servis Equipment Company, Dallas, Tex.
Filed Mar. 27, 1970, Ser. No. 24,668
Int. Cl. E21c *1/14, 11/02*
U.S. Cl. 173—38 **9 Claims**



An earth boring apparatus for attachment to a tractor rear lift mechanism and power take off (P.T.O.) and having a telescoping boom for pivotally supporting an auger in vertical position throughout the arcuate swinging of the boom about a horizontal arc in coaction with a lifting bail and a stabilizer control link, the driven gear of the auger being connected to P.T.O. by a telescoping drive shaft.

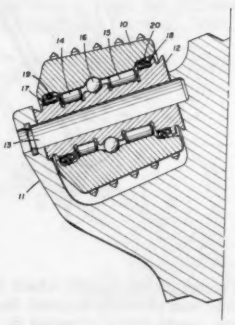
3,604,522
PILE-DRIVING SYSTEM AND APPARATUS
Samuel Clifford Doughty, Burlingame, Calif., assignor to Santa Fe International Corporation, Santa Fe Springs, Calif.
Filed Aug. 30, 1968, Ser. No. 756,685
Int. Cl. E02d *7/00*
U.S. Cl. 173—88 **3 Claims**

A system for driving piles by a succession of blows struck from above by a hammer element wherein a driving head assembly transfers the blow to the upper end of a hollow elongated pile. The driving head comprises an anvil element to engage the upper end of a pile and includes an elongated hollow case extension portion containing the reciprocable hammer element. A cable connected to the hammer element extends upwardly to an outdoor work platform for hoisting



and lowering the driving head assembly. A pulley driven by hydraulic actuator means provides reciprocating movement to the hammer element.

3,604,523
SILICON CARBIDE SEAL FOR AN EARTH BORING BIT
Carl L. Lichte, Dallas County, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed June 1, 1970, Ser. No. 42,178
Int. Cl. E21b *9/08;* **F16c** *19/00*
U.S. Cl. 175—372 **13 Claims**

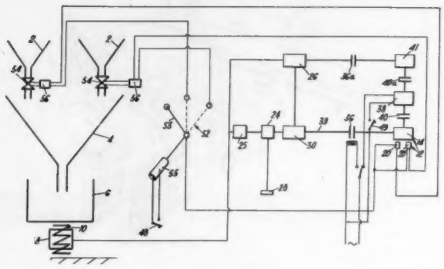


A seal for containing lubricant in the bearings of an earth-boring bit wherein the bit is used in a highly abrasive environment. At least one seal element encircles the shaft of the bit and retains lubricant in the bearings of the bit. The surface of the seal is silicon carbide and the seal will withstand a highly abrasive and corrosive environment.

3,604,524
ELECTRICAL WEIGHING APPARATUS OF THE POTENTIOMETRIC BALANCE TYPE
Campbell Dean Boadle, Pentwyn, Ponthir Rd., Caerleon, Monmouthshire, Wales
Continuation of application Ser. No. 599,869, Dec. 7, 1966, now abandoned. This application Mar. 24, 1969, Ser. No. 810,918
Int. Cl. G01g *19/22*
U.S. Cl. 177—70 **4 Claims**

A weighing apparatus of the potentiometric balance type comprising a weighing container, one or more electrical

transducers arranged beneath the container, a self-balancing potentiometer for measuring the output signal of the transducers, a servomotor driving potentiometer shaft and energized by a difference signal produced by the transducers and the potentiometer and representative of the weight on the said



container, control and indicating means driven by the said servomotor, means for disconnecting the indicating and control means from the servomotor, and means for automatically returning the control and indicating means to zero after the said disconnection has taken place.

3,604,525

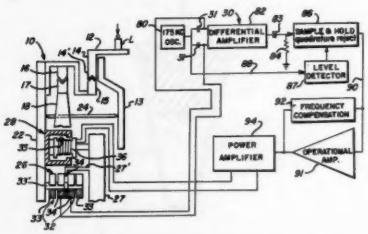
AUTOMATIC TOP-LOADING WEIGH APPARATUS WITH ELECTRONIC MEASURING AND RECORDING CIRCUIT

Charles B. Blethen, Green Mountain, and James E. Smith, Longmont, both of, Colo., assignors to Wm. Ainsworth, Inc., Denver, Colo.

Filed Aug. 15, 1969, Ser. No. 850,317

Int. Cl. G01g *3/14*

U.S. Cl. 177—210 **10 Claims**



A top-loading weigh apparatus has a stabilized balance beam mechanism with the load being vertically applied through a horizontal balance arm on a pair of spaced pivots, and a differential capacitance is developed by sensing the horizontal displacement of a stabilized beam isolated from the weighing area. The capacitance developed in response to beam displacement is converted into a variable current output and applied as a restoring force proportional to but in opposition to the unbalancing force in order to quickly and accurately return the beam mechanism to its null position. A voltage is developed in direct proportion to the variable current output required to restore the beam to its null position and which is translated for recording and visual display of the applied weight.

3,604,526

ARTICULATED VEHICLE

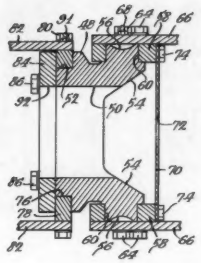
Marion E. Hutchison, Omaha, Nebr., assignor to Omsteel Industries, Inc.

Filed July 8, 1969, Ser. No. 839,877

Int. Cl. B60k *17/34;* **B62d** *53/02*

U.S. Cl. 180—51 **4 Claims**

A connecting means for interconnecting independent, wheeled frames of an articulated vehicle. Connecting means include a casting having a pair of vertically projecting stub shafts which are pivotally secured to one of the frames and a horizontally projecting stub shaft which is pivotally retained in the other of the frames so that a vertically projecting stub shaft provides for movement of one frame relative to the other about a vertical axis while the horizontally arranged stub shaft provides for relative movement about a horizontal axis. Further, in one embodiment, the casting is provided with a hollow center so that drive means for, for example, a four-wheel drive vehicle may extend through the joint between frames.



3,604,527

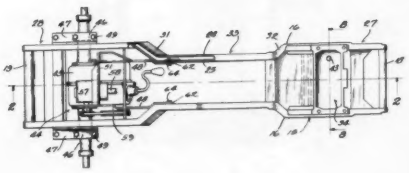
TRACTOR SUBASSEMBLY

Warren H. Price, Sheboygan, Wis., assignor to Gilson Bros. Co., Plymouth, Wis.

Continuation of application Ser. No. 672,095, Oct. 2, 1967, now abandoned. This application Dec. 10, 1969, Ser. No. 880,479

Int. Cl. B60k *5/02*

U.S. Cl. 180—64 **7 Claims**



A subassembly for a tractor, including a frame, engine base and rear drive unit. The drive unit is removably mounted on a rear raised section of the frame and consists of a removable package including a transaxle and mounting subframe. The engine base is integrated with a forward dropped section of the frame.

3,604,528

STEERING CONTROL

William A. Williamson, Niles, Mich., assignor to Clark Equipment Company

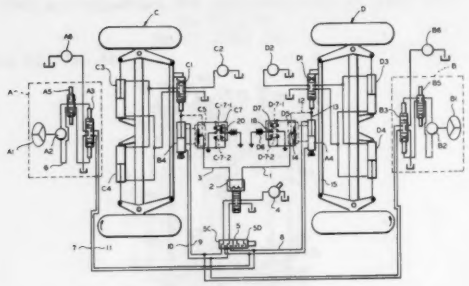
Filed June 2, 1969, Ser. No. 829,545

Int. Cl. B62d *5/04*

U.S. Cl. 180—79.2 R **7 Claims**

Electrohydraulic servosystem providing for multiple modes of steering for a vehicle having spaced wheel steering assemblies preferably adjacent ends of the vehicle. Spaced operator's control positions are provided one adjacent each wheel assembly, either of which may be selectively controlled by an operator positioned therein, for modes of steering such as

crab steering and radiarc steering. The wheel steering assembly assuming the new mode of steering, in transition from one mode to the other, bears the same relationship to the vehicle driver (operator) position regardless of the end of the vehicle from which steering is controlled.



3,604,529

APPARATUS FOR ULTRASONIC WAVE TRANSMISSION

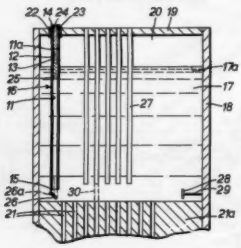
John Roderick Fothergill, Culcheth, Warrington, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed May 2, 1969, Ser. No. 821,391

Claims priority, application Great Britain, May 10, 1968, 22350/68

Int. Cl. G01s *9/66;* **H04b** *11/00*

U.S. Cl. 181—0.5 **13 Claims**



A waveguide for the transmission of ultrasonic waves adapted to operate immersed in a liquid consists of a duct capable of transmitting ultrasonic waves produced by a generator at the end of the duct. The duct has an outer jacket defining a closed volume about the duct preventing access of liquid, in which the waveguide is immersed, to the outer surface of the duct. By this means energy loss due to wave scatter at the outer surface of the duct is minimized.

3,604,530

SILENCER DEVICE FOR JET AIRCRAFTS

Louis Duthion, Paris; Pierre Bonnet, Paris, and Paul A. L. Coudray, Villepreux, all of, France, assignors to Bertin & Cié, Plaisir, Yvelines, France

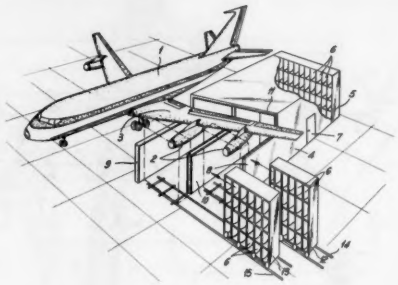
Filed June 10, 1969, Ser. No. 831,923

Claims priority, application France, June 12, 1968, 154,702

Int. Cl. E04h *;* **F01n** *1/00;* **B64f** *1/26*

U.S. Cl. 181—33 HE **9 Claims**

A fixed silencing system for jet aircraft in particular, comprising essentially a chamber or enclosure formed by a structure so cut away at the front part as to accommodate that portion of the aircraft which bears the or each jet engine requiring to be silenced, the rear end of the structure being closed by at least one soundproofing partition, and one or more movable soundproofing panels being provided to close the front part in front of the or each jet engine.



3,604,531

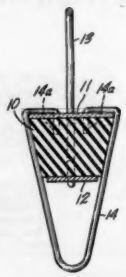
NOISE AND VIBRATION-ATTENUATING HANGER

Jack Harris, Forest Hills, N.Y., assignor to Korfund Dynamics Corporation, Westbury, N.Y.

Filed July 23, 1970, Ser. No. 57,546

Int. Cl. E04b *1/86*

U.S. Cl. 181—33 GD **6 Claims**



A noise and vibration-attenuating hanger which includes a resilient element intermediate upper and lower rigid plates, an overhead hanger engaging the lower plate and extending upwardly adjacent two opposite sidewalls of the resilient element and a depending hanger engaging the upper plate and extending downwardly adjacent two other opposite sidewalls of the resilient element, the said sidewalls of the resilient element tending to bulge outwardly under compression to push adjacent portions of the hangers outwardly and prevent the overhead hanger from engaging an edge of the lower plate and the depending hanger from engaging an edge of the upper plate which engagement would bridge the resilient element and nullify the effect thereof.

3,604,532

QUICK RELEASE PERSONNEL TRANSFER DEVICE BETWEEN BOAT AND PLATFORM

Douglas W. Moore, Metairie, La., assignor to Compressors Automation Controls, Inc., Marrero, La.

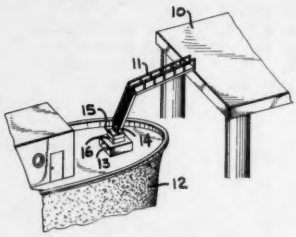
Filed Mar. 2, 1970, Ser. No. 15,729

Int. Cl. E06c *5/24*

U.S. Cl. 182—93 **3 Claims**

This disclosure is directed to a quick release device

between a personnel boat and an offshore rig employing a magnetic coupling of the permanent type which resists axial separation but permits shear or slide separation.

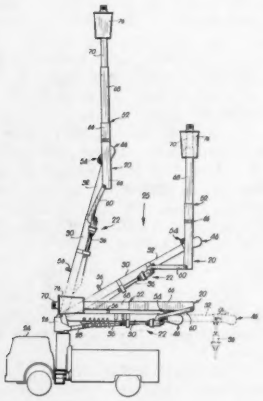


3,604,533

COMBINATION TELESCOPIC AND ARTICULATED AERIAL BUCKET DEVICE

George H. Eckels, Prairie Village, and Wade A. Eskridge, Overland Park, both of, Kans., assignors to A. B. Chance Company, Centralia, Mo.

Filed Sept. 10, 1969, Ser. No. 856,706
Int. Cl. B66f *11/04*
U.S. Cl. 182—46 **18 Claims**



A combination telescopic and articulated aerial bucket device has a boom assembly including a swingable member pivotally mounted on one telescopic section and pivotally connected through linkage structure to a second telescopic section. Relative hydraulic shifting of the two sections causes the linkage structure to effect swinging of the member to elevate an aerial bucket at the outer end thereof. Four species of the device embody alternative linkage structure and corresponding mounting arrangements for the swingable member.

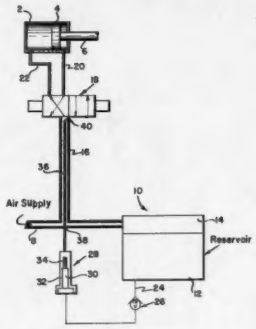
3,604,534

AUTOMATIC METERED, PULSING LUBRICATION SYSTEM

Jack L. Whitaker, Horseheads, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Sept. 26, 1969, Ser. No. 861,360
Int. Cl. F16n *7/00*
U.S. Cl. 184—7 R **7 Claims**

An automatic metered, pulsing lubrication system for a pneumatic piston and cylinder device including an adjustable metering valve operative in response to momentary pressure changes in the air lines to inject a metered quantity of lubricant in the air line, the lubricant being carried to the cylinder by the airstream through the air line. The system may be utilized to lubricate the piston and cylinder on each stroke of the piston, or on every other stroke of the piston.

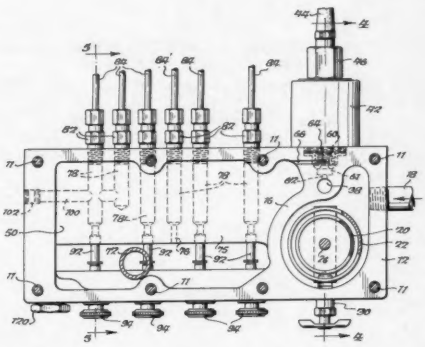


3,604,535

AUTOMATIC OILING SYSTEM

Jack L. Whitaker, Horseheads, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Apr. 23, 1969, Ser. No. 818,543
Int. Cl. F16n *7/30*
U.S. Cl. 184—7 R **11 Claims**



An oiling system in which oil is supplied to various parts of a machine by air pressure acting on the top of the oil reservoir while oil is fed from the lower part of the oil reservoir through ducts each having metering units to control the oil fed to various parts of the machine, some of the oil ducts being arranged within the air lines.

3,604,536

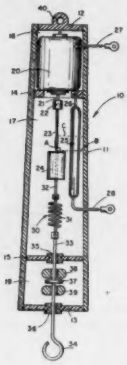
LOW WATTAGE DISPLAY ENERGIZER

Albert J. Dinnerstein, 1416 Granada Place, Far Rockaway, N.Y.

Continuation-in-part of application Ser. No. 841,707, July 15, 1969, now Patent No. 3,533,489, which is a continuation-in-part of application Ser. No. 659,161, Aug. 8, 1967, now Patent No. 3,456,762. This application June 29, 1970, Ser. No. 50,566
Int. Cl. F03g *1/08;* **G09f** *11/10*
U.S. Cl. 185—40 R **15 Claims**

A device, which consumes little power while producing a variable slow rate of continuous rotation of a display, having a self-regulating intermittently operating higher speed elec-

tric motor, an electric circuit connecting the motor to a power supply, a switch assembly connected to the electric circuit in series with the power supply and the motor for starting and stopping the operation of the motor, and a mechanism operatively associated with the motor and the



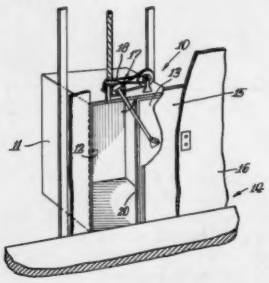
display. The mechanism permits continuous rotation of a light or heavy weight display in any plane and is provided with a first member for storing rotating energy and a second member for controlling the opening and closing of the switch assembly upon the storing of a predetermined amount of rotating energy by the first member.

3,604,537

ELEVATOR DOOR OPERATOR WITH DIFFERENTIAL TORQUE MOTOR SYSTEM

Henry J. Holuba, Moline, Ill., assignor to Montgomery Elevator Company

Filed Jan. 27, 1969, Ser. No. 794,100
Int. Cl. B66b *13/00*
U.S. Cl. 187—52 **8 Claims**



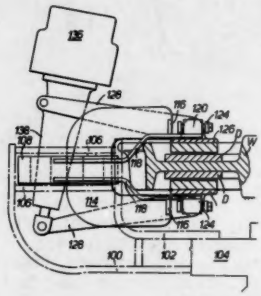
Elevator door operator using a differential torque motor system which is particularly advantageous in opening and closing the doors of passenger and freight elevators. The motor system provides a first torque in moving the door to the open position and a second, lower torque in moving the door to the closed position. The force moving the door to the closed position is so limited as to be within the range of present safety regulations which limit the force necessary to prevent closing of such elevator doors from rest to no more than 30 pounds. The differential motor control is obtained by utilizing series and shunt field windings which are selectively cumulatively compounded for opening and differentially compounded for closing.

3,604,538

RAILWAY VEHICLE BRAKES

John B. Tompkin, Tyseley, England, assignor to Girling Limited, Birmingham, England

Filed Apr. 3, 1969, Ser. No. 813,122
Claims priority, application Great Britain, Apr. 11, 1968, Oct. 30, 1968, 17,716/68;51,449/68
Int. Cl. B61h *5/00*
U.S. Cl. 188—59 **2 Claims**



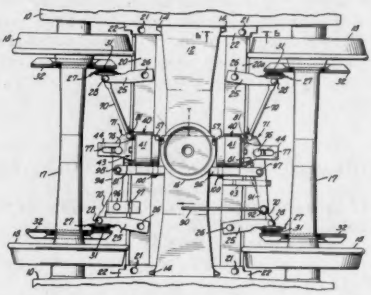
A railway vehicle disc brake which comprises a yoke, a pair of opposed caliper levers pivotally mounted on the yoke, a pair of brakeshoes one pivotally mounted at the inner end of each lever, an actuating motor for separating the outer ends of the levers to move the shoes towards each other, whereby in use the said shoes can be applied to opposite sides of a brake rotor which comprises a disc or discs mounted for rotation with a wheel of the vehicle, and a suspension link for each shoe, each link being pivotally connected at one end to its shoe and at its other end to a rigid support structure and serving in use to resist pivotal movement of the shoe about its pivotal connection with the caliper lever, relative to the brake rotor, wherein the rigid support structure is fast with the yoke and resilient suspension means are provided for mounting the yoke on a railway vehicle frame in a manner accommodating some misalignment between the vehicle frame and the brake rotor without any substantial corresponding reaction being transmitted back to the vehicle frame during braking.

3,604,539

RAILWAY CAR BRAKE MECHANISM

Edward G. Goods, Snyder, N.Y., assignor to Buffalo Brake Beam Company

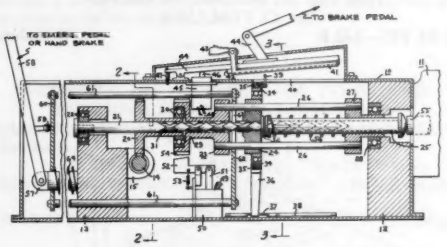
Continuation-in-part of application Ser. No. 724,787, May 9, 1968, now abandoned , which is a continuation of application Ser. No. 611,860, Jan. 26, 1967, now Patent No. 3,422,131, which is a continuation-in-part of application Ser. No. 417,658, Dec. 11, 1964, now Patent No. 3,307,659. This application Mar. 2, 1970, Ser. No. 15,628
Int. Cl. F16d *55/32*
U.S. Cl. 188—59 **8 Claims**



Railway brake device having brake discs rigid with car wheels, and brake means in the form of toggle joint

mechanisms with rods movable into alignment for braking actions against these discs by the relative movement of air pressure cylinder and piston devices having articulated connections between adjoining ends of such rods and the piston rod. A spring in this cylinder acts progressively to decrease the input force exerted on the toggle to the extent that the resultant output braking force resulting from the progressively increasing mechanical advantage of the toggle acting on said progressively decreasing input force, is substantially uniform over a major portion of the brake applying movement of the cylinder and piston mechanism.

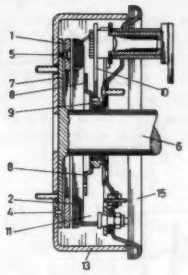
3,604,540
BRAKE ACTUATOR
Ottavio Falcone, 2421 S. 15th St., Philadelphia, Pa.
Filed June 23, 1969, Ser. No. 835,436
Int. Cl. F16d *65/34*
U.S. Cl. 188—106 R **8 Claims**



A brake actuator mechanism including an axiaLly shiftable plunger engaged with the piston of the master cylinder of a hydraulically operated automotive brake system to provide a power braking system. Axial movement of the plunger is accomplished by a shaft internally rotatable within the plunger in screw-threaded relationship with a follower nut carried thereon which moves the plunger. Rotation of the shaft in brake-applying direction is caused by electrical energization of an electric motor coupled to the shaft through a worm gear and pinion drive. Operation of the motor results from depression of the vehicle brake pedal which energizes the motor through a movable switch contact, the switch contact being physically shifted with the follower nut as the latter moves the plunger axially for engaging the master cylinder piston. A solenoid is also provided to lock the follower nut against rotation while it is being driven axially for engaging the brake. The solenoid lock is released when the brake pedal is undepressed, and a spring mechanism returns the follower nut and plunger to their retracted positions.

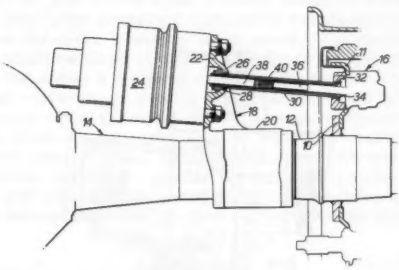
3,604,541
ELECTROMAGNETICALLY ACTUATED BRAKE
Ernst Menzi, Widnau, Switzerland, assignor to Ernst Menzi A.G., Widnau, Switzerland
Filed July 2, 1969, Ser. No. 838,525
Claims priority, application Austria, July 5, 1968, A6510/68
Int. Cl. F16d *65/34*
U.S. Cl. 188—164 **6 Claims**

A brake in which a cam expands brakeshoes into engagement with a rotating brake drum when the cam is turned by a motion-transmitting train connected to an annular electromagnet freely movable on the shaft which carries the drum. The magnet stands still when not energized and is axially attracted toward an armature disc on the shaft and angularly displaced by the rotating disc when energized. Full frictional engagement between the annular pole face of the magnet and the opposite face of the armature disc could block the brake and is prevented by a setscrew on the brake drum



which deflects a small abutment portion of the disc axially toward the pole face.

3,604,542
VEHICLE BRAKE ACTUATOR MOUNTING
John Leslie Cullen, Langley, England, assignor to Girling Limited, Birmingham, England
Filed Dec. 8, 1969, Ser. No. 883,130
Claims priority, application Great Britain, Dec. 30, 1968, 61593/68
Int. Cl. B60t *11/10;* **F16d** *65/32*
U.S. Cl. 188—368 **9 Claims**

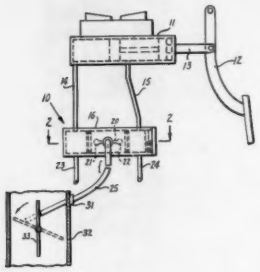


In a fluid-operated vehicle brake assembly of the type wherein space considerations prevent the brake actuator from being assembled directly on to the brake torque plate and therefore require the brake actuator to be mounted on some form of extension arm or equivalent member which enables it to be positioned remotely from the torque plate, the invention provides a brake actuator mounting on a bracket rigidly connected to a vehicle axle assembly and a self-aligning tubular member acting between the bracket and the torque plate to contain the forces acting between them during a braking operation, the tubular member also acting as a housing for an actuator rod extending from the actuator and for a brake expander rod extending from a brake expander mounted on the torque plate the two rods being coupled together within the tubular member for enabling brake-actuating forces to be transmitted from the brake actuator to the brake expander.

3,604,543
THROTTLE STOP RESPONSIVE TO BRAKE FAILURE
Charles A. Glaspell, Pleasant Valley Rd., Fairmont, W. Va.
Filed Feb. 17, 1970, Ser. No. 12,045
Int. Cl. F16d *67/00*
U.S. Cl. 192—3 R **5 Claims**

A safety system for dual brakes of a type having dual master cylinders for operation of the front and rear brakes

independently. A compensating cylinder connects the front and rear brake lines so that upon normal operation of the brakes the piston thereof is centered. When either brake system fails the piston moves to the end of the compensating

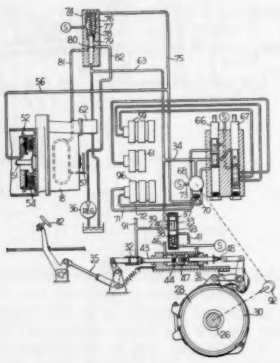


cylinder due to the lack of pressure at that end and a stop member is released by the piston to stop the throttle valve from opening beyond a point at which relatively low speed of the vehicle will be attained.

3,604,544
FORWARD-REVERSE TRANSMISSION AND BRAKE CONTROL FOR TRACTORS

Roy C. Ross, Springfield, Ill., and Martin W. Coleman, Independence, Mo., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Apr. 15, 1970, Ser. No. 28,598
Int. Cl. F16h *57/10*
U.S. Cl. 192—4 C **5 Claims**



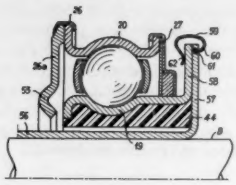
The vehicle brakes are automatically applied when the transmission is shifted to neutral in response to a decrease in pressure in the fluid supply for the fluid-operated forward and reverse clutches of the transmission.

3,604,545
SELF-ALIGNING CLUTCH BEARINGS WITH VIBRATION DAMPER

Claude Raymond Bourgeois, Annecy, France, assignor to Societe Nouville De Roulements, Annecy (Haute Savoie), France

Filed Sept. 2, 1969, Ser. No. 854,576
Claims priority, application France, Sept. 5, 1968, 165,174
Int. Cl. F16d *23/00*
U.S. Cl. 192—98 **7 Claims**

The present invention is concerned with improved ball bearings for clutch mechanism, wherein the bearing races engaged by the balls are impressed in annular members consisting of rolled steel sheet to which a suitable contour is given, members being provided for incorporating the bearings in the clutch mechanism and possibly imparting a self-centering

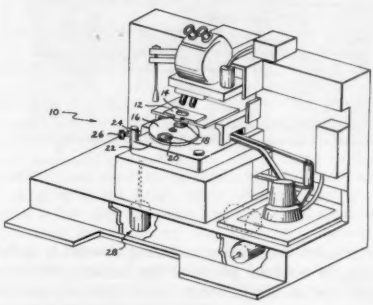


characteristic thereto, means being also provided for making said bearing self-lubricating and noiseless in actual service.

3,604,546
ANGULAR REGISTRATION ASSEMBLY AND DRIVING APPARATUS THEREFOR

Gordon Willis, Cambridge, Mass., assignor to Computervision Corporation, Walthom, Mass.

Filed Aug. 18, 1969, Ser. No. 850,786
Int. Cl. F16d *71/04*
U.S. Cl. 192—142 R **4 Claims**



An apparatus for establishing angular registration between a movable object and another object has photoelectric means for generating off-register signals relative to the θ axis. The off-register signals are coupled to a θ motor, which motor drives a driven gear mounted for free rotation on a rotatable shaft mechanically coupled to the movable object. A slip clutch assembly including a friction surface on one side of the driven gear and a compressed spring on the other frictionally engages the motor and the shaft, and a knob or handle is secured to the outer end of the shaft to give a manual adjusting capability to the driving apparatus. Means are preferably provided for adjusting the spring's compression and for preventing the spring from winding up during manual operation.

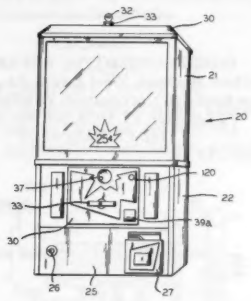
3,604,547
MERCHANDISE-VENDING MACHINE

Richard K. Bolen, Morris, Ill., assignor to The Northwestern Corporation, Morris, Ill.

Filed Aug. 22, 1969, Ser. No. 852,185
Int. Cl. G07f *11/00*
U.S. Cl. 194—2 **2 Claims**

A bulk merchandise-vending machine with a base supporting a merchandise storage member, a mechanism plate positioned to form a closure member for at least a part of the base and removable therefrom by a pivotal movement without removing the storage member, a slug rejector mechanism on the base for distinguishing between coins and slugs, a coin wheel on the base and rotatable to operate a merchandise-dispensing mechanism when a coin is deposited in the machine and passes through the slug rejector

mechanism, a slug chute on the plate for carrying slugs from the slug rejector mechanism out of the merchandise-vending machine, a latch to prevent rotation of the coin wheel when a



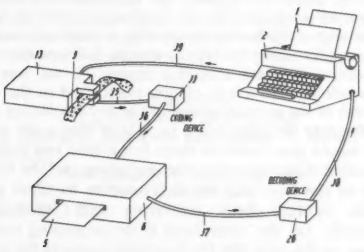
coin has not been deposited in the coin wheel, and means defining a compartment for housing the latch to prevent access thereto via the slug chute.

3,604,548

RECORDING ARRANGEMENT FOR TYPING AND PUNCHING THE SAME INFORMATION

Gerhard Ritzerfeld, Schorlemer Allee 14, Berlin 33 (Dahlem), Germany

Filed June 5, 1968, Ser. No. 734,615
Claims priority, application Germany, June 7, 1967, R 46201
Int. Cl. B41j *5/36*
U.S. Cl. 197—20 **3 Claims**



The arrangement comprises a punching device and a printing device in the form of a typewriter having a series of type actions. One of the devices, for example the punching device, is controlled by a readout device reading out information recorded on a record carrier, and corresponding punching operations are carried out in a card. Output means of the punching device are connected by control means to the type actions of the typewriter so that the same types the identical information on a copy sheet, which is punched into the card. The arrangement can be reversed, but in any event, the punching device and the typewriter are directly connected.

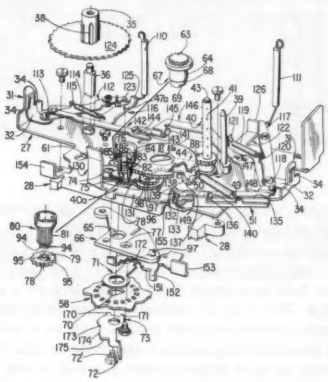
3,604,549

DUAL FEED RATE RIBBON MECHANISM AND SUPPLY CARTRIDGE THEREFOR

Allison H. Caudill, and Willie Goff, Jr., both of Lexington, Ky., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation-in-part of application Ser. No. 609,136, Jan. 13, 1967, now abandoned. This application July 16, 1968, Ser. No. 752,096
Int. Cl. B41j *33/14*
U.S. Cl. 197—151 **8 Claims**

A ribbon feed mechanism for feeding a substantially constant linear or longitudinal amount of single pass ribbon past a printing position during each ribbon feed cycle. A cartridge, which is removably mounted on a baseplate, has a supply spool and a takeup spool rotatably mounted therein with the ends of the single pass ribbon attached thereto. The bottom wall of the cartridge has a curved slot to receive a resiliently biased drive roller, which is rotatably mounted on a pivotal arm on the baseplate and has pointed projections thereon for penetrating the inked ribbon on the takeup spool to linearly advance the ribbon past its printing position. The drive roller is rotated by a gear train during each actuation of a character key on the typewriter. Means change the gear



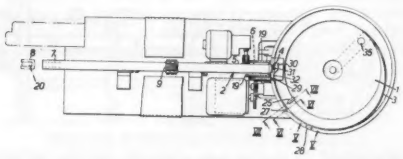
ratio of the gear train to cause a smaller amount of rotation of the drive roller during each actuation of a character key to advance the ribbon a smaller linear amount. The cartridge has a cylindrical recess to receive a portion of the gear train. When the ribbon is a solvent coated plastic transfer matrix whereby overstriking is desired, then resiliently biased means is disposed within the recess in the cartridge to render the change means operative to reduce the amount of rotation of the drive roller. If a total release ribbon is used wherein no overstriking is desired, then the recess in the cartridge is empty and the larger amount of rotation of the drive roller occurs because the change means is not rendered operative.

3,604,550

ARTICLE DELIVERY APPARATUS

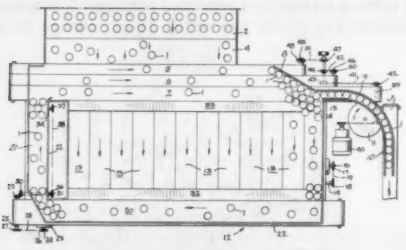
Peter Martin Zollman, Weybridge; Julian Pascoe Grenfell, Weybridge, and David John Brown, New Malden, all of, England, assignors to Badalex Limited, Weybridge, Surrey, England

Filed Aug. 22, 1969, Ser. No. 852,394
Int. Cl. B65g *37/00, 47/42*
U.S. Cl. 198—21 **8 Claims**



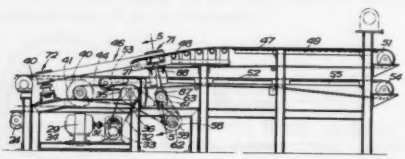
A delivery apparatus for delivering articles in a timed relation at a delivery station from a supply station to which the articles are delivered at random time interval, the apparatus including a conveyor for carriers, a loading control to randomly release loaded carriers for movement by the conveyor, and delivery device for receiving the conveyors and delivering the articles therein at predetermined intervals.

3,604,551
ARTICLE CONVEYOR FLOW CONTROL AND UNSCRAMBLING APPARATUS
Roger H. Fink, Asheville, N.C., assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Oct. 13, 1969, Ser. No. 865,589
Int. Cl. B65g 47/26
U.S. Cl. 198—30 6 Claims



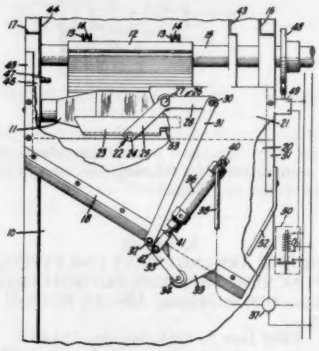
An apparatus for controlling the flow or movement of articles such as containers on a conveyor system and particularly for handling a change from one mode of conveyance to another such as a change from rows of containers on a broad conveyor belt to a single file of containers on a narrow conveyor belt. The rows of containers move from the end of the broad belt across a transfer means such as a vibrating plate onto an unscrambling means comprising several moving conveyors run at right angles across the end of the broad belt. The containers are funneled by a guide means from the unscrambler conveyors into a single-file arrangement on a removal conveyor. An accumulator table is positioned along the edge of the outermost of the three unscrambler conveyors to receive excess containers which cannot be accepted on the removal conveyor and which temporarily stores these containers until they move onto the removal conveyor. The accumulator table comprises a large number of short parallel conveyor belts running at right angles to the unscrambler conveyors and which carry the excess containers away from the unscrambler conveyors towards an L-shaped conveyor return system which returns the containers to the unscrambler conveyors.

3,604,552
CONVEYING APPARATUS FOR SPLITTING A SINGLE STREAM OF ROOFING TILES ON PALLETS INTO TWO STREAMS
Leslie James Marshall, Reigate, England, assignor to Redland Tiles Limited, Reigate, Surrey, England
Filed Aug. 26, 1969, Ser. No. 853,109
Claims priority, application Great Britain, Sept. 9, 1968, 42,883/68
Int. Cl. B65g 47/30
U.S. Cl. 198—31 7 Claims



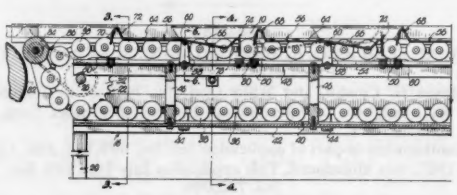
A tile manufacturing plant includes apparatus for dividing a stream of freshly moulded tiles on pallets into two streams, comprising a first conveyor which carries the pallets at regular intervals and a second conveyor, synchronized with the first, which removes selected pallets from the first conveyor to form a second stream. The second conveyor comprises two parallel chains, situated one on each side of the first conveyor and diverging upwardly from the path thereof, the chains having at intervals along their lengths lifter sections to engage under and lift pallets on the first conveyor. The plant also includes apparatus for loading the streams of pallets into racks for curing the tiles, and for unloading the racks.

3,604,553
BOBBIN-ORIENTING APPARATUS
Rudolf Herbert Haehnel, West Lawn, Pa., assignor to North American Rockwell Corporation, Pittsburgh, Pa.
Filed Mar. 12, 1970, Ser. No. 18,874
Int. Cl. B65g 47/24
U.S. Cl. 198—33 AD 7 Claims



Apparatus for rearranging bobbins as the bobbins are received from a spinning machine in a disoriented mass and delivering them to a bobbin preparatory unit or the like with their enlarged base ends first. The apparatus includes a tiltable tray to which the bobbins are delivered with their base ends pointed in either direction longitudinally of the tray but with one end of the bobbin projecting beyond one end of the tray, means for tilting the tray to elevate said one end thereof to a position in which a bobbin resting on the tray would slide therefrom, and a pair of pins positioned in the path of movement of the projecting end of the bobbin during the tilting of the tray the pins being so spaced that a tip end of a bobbin would pass between them but a base end would not. In operation if the tip end is the projecting end the bobbin is carried by the tray until the tray reaches its tilted position and the bobbin slides therefrom with its base end downwardly. On the other hand if the projecting end is the base end, as the tray tilts the base end contacts the pins and is held thereby and the bobbin is flipped from the tray to fall again with its base end downwardly.

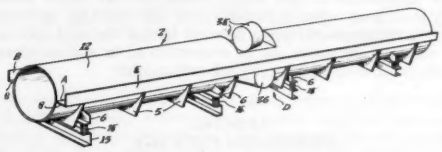
3,604,554
TRAY-SPACING CONVEYOR
Robert L. Martz, Grandview, Mo., assignor to Gordon Johnson Company, Kansas City, Mo.
Filed Jan. 22, 1970, Ser. No. 4,869
Int. Cl. B65g 39/20
U.S. Cl. 198—183 18 Claims



An article transfer apparatus has a conveyor provided with rotatable, article-supporting rollers. Movable article-spacing

devices used in conjunction with the conveyor have stops, normally held down by gravity, and depressors, which are lowered and held down by an article resting thereon to raise the corresponding stops into the path of the articles. Accelerator pad means engaged by the rollers rotate the latter to augment advancement by the articles.

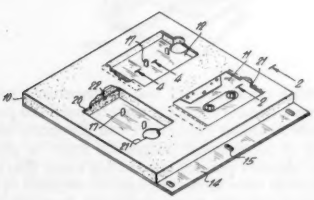
3,604,555
VIBRATORY CONVEYOR
Gerald Cowper, 65, Holmrock Rd., Carlisle, England
Filed July 8, 1969, Ser. No. 839,952
Claims priority, application Great Britain, July 15, 1968, 33,566/68
Int. Cl. B65g *27/00*
U.S. Cl. 198—220 DB **14 Claims**



A conveyor for particular materials such as chemicals, minerals and foodstuffs, is made form one or more units which extend longitudinally with a conveying surface disposed to one or both sides of a structural member in a direction substantially parallel to the longitudinal direction of the member.

Means are provided to convey a helical reciprocating movement to the units about an axis lying in the longitudinal direction of the structural member and this may effectively be provided by means of vibrator motors with out-of-balance loading. Conveyors with two conveying surfaces can thus be used to convey materials in two directions as the movement on one surface will be in a forwards direction and that on the other surface will be in a backwards direction.

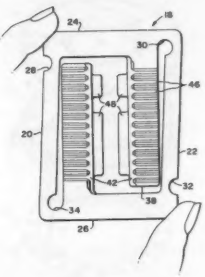
3,604,556
TAPE CASSETTE HOLDER
Louis E. Schwartz, New York Law School, 57 Worth St., New York, N.Y.
Filed Jan. 14, 1970, Ser. No. 2,843
Int. Cl. B65d *25/00*
U.S. Cl. 206—1 R **7 Claims**



Recesses within a thickened support member receive tape cassettes. A resilient member at one end of each recess permits the cassette to be inserted and removed from beneath opposed cassette-retaining flanges. Information on each side of the cassettes may be read without removing the cassettes from the support members.

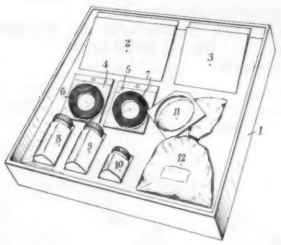
3,604,557
CARRIER
Nicholas J. Cedrone, 40 Bear Hill Rd., Waltham, Mass.
Filed July 24, 1969, Ser. No. 844,390
Int. Cl. A45c *11/00*; **B65d** *85/00*
U.S. Cl. 206—1 R **3 Claims**

A carrier for small objects comprises a four-sided member forming a distortable parallelogram. Brackets extending from two opposed arms remain substantially parallel during this distortion, whereby they may be moved apart for receiving or



releasing an object, and resiliently urged together to hold the object.

3,604,558
EDUCATIONAL GAMES
Roger Frerebeau, Paris, France, assignor to Societe d'Edition et de Diffusion de Publication Sedip-Inter, Paris, France
Filed Mar. 20, 1969, Ser. No. 808,820
Int. Cl. B44d *3/00*, *3/22*, *5/00*
U.S. Cl. 206—1.7 **3 Claims**

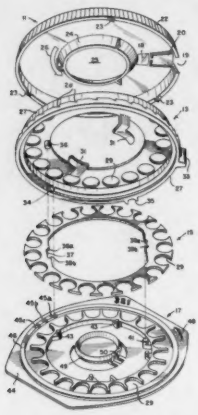


An educational game characterized in that it consists of a box in which are disposed, in compartments or locations provided to this end, support means such as sheets of cardboard, wood or other suitable porous material, which may have different colors, books of separate sheets on which outline drawings are printed to constitute models or suggestions for other designs, patterns or imaginary compositions, preferably with reference data concerning the colors to be adapted for coloring each area bounded by a line, one or a plurality of lengths of a thin strip of flexible and malleable plastic or metallic material, for example alumetized aluminum, a bottle filled with a glue for causing sections of said strips cut to the desired lengths to adhere edgewise to the selected support, and possibly for filling in the coloisonne structure thus obtained and diluting the decoration gouache, and a bottle of special cold-enamelling varnish adapted to coat the finished work and impart thereto a brightness comparable to that of enamel.

3,604,559
MULTILAYER DISPENSER FOR PILLS
Calvin W. McCall, Roanoke, and Robert C. McDonald, Vinton, both of, Va., assignors to Eli Lilly and Company, Indianapolis, Ind.
Filed Oct. 15, 1969, Ser. No. 866,450
Int. Cl. B65d *83/04*
U.S. Cl. 206—42 **4 Claims**

The invention relates to a pill dispenser having a plurality of pill compartments arranged in layers. The layers are relatively rotatable on a common axis and are provided with mul-

tiple position clutch means for aligning the compartments of preceding layers on repeated advancement of the top layer

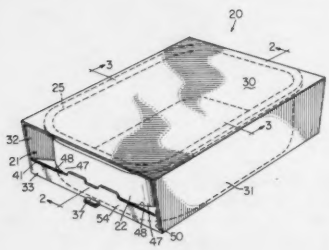


relative to the bottom layer as the pills are dispensed in sequence.

3,604,560
TAMPERPROOF CARTON AND BLANK FOR MAKING SAME

Melville T. Farquhar, Bon Air, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Dec. 29, 1969, Ser. No. 888,503
Int. Cl. B65d *85/00*
U.S. Cl. 206—46 FD **20 Claims**



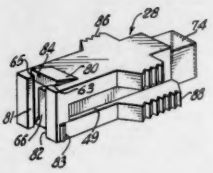
A tubular carton is provided which has substantially open ends and a bottom wall provided with extension flaps extending from its opposite ends. Each extension flap has a plurality of parallel fold lines defined therein which enable folding thereof to define an end stop used to stop or hold an article carried within the carton against outward movement and each extension flap has a locking tab which locks it in its folded position so that with an article within the carton it is impossible to unfasten either locking tab without damaging its associated extension flap or tearing the carton to thereby define a tamperproof carton.

3,604,561
MULTIPLE STAPLER CARTRIDGE

Rudolph F. Mallina, Hastings-on-Hudson, N.Y., and Harry G. Reimels, Braintree, Mass., assignors to Codman & Shurtleff, Inc.

Division of Ser. No. 626,445, Mar. 28, 1967, Pat. No. 3,489,330
Filed Aug. 7, 1969, Ser. No. 848,243
Int. Cl. B65d *83/00*
U.S. Cl. 206—46 DF **5 Claims**

A miniature stapler useful in the surgical repair of tissue fastens at each actuation a single miniature staple and is constructed with two movable arms, the free ends of which function as a driver and anvil. A cartridge containing a series of staples is removably mounted between the two movable arms in such a position that the first staple in the series is pushed out of the cartridge by the driver and clinched against the

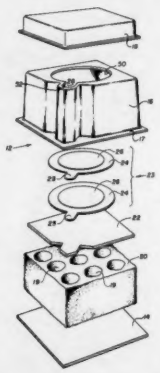


anvil when the two arms are moved toward one another. After application of the staple, when the two arms move away from each other, a pusher within the cartridge operates to move the series of staples forward so that the next successive staple in the series will be in position to be applied when the movable arms again approach one another.

3,604,562
DISPENSING PACKAGE

Herbert H. Loeffler, Arlington, Mass., assignor to Amicon Corporation, Lexington, Mass.

Continuation-in-part of application Ser. No. 767,211, Oct. 14, 1968, now abandoned. This application June 24, 1969, Ser. No. 836,104
Int. Cl. B65d *83/00*
U.S. Cl. 206—56 AC **5 Claims**



In a dispensing container for use in dispensing packaged articles wherein a biasing means is used to push the packaged articles towards an outlet therefrom, the particular improvement whereby a compressed polymeric foam is used as a biasing means, thereby providing a biasing force that remains more uniform with time as the package is emptied of articles and also avoids locally high pressures bearing on the packaged articles.

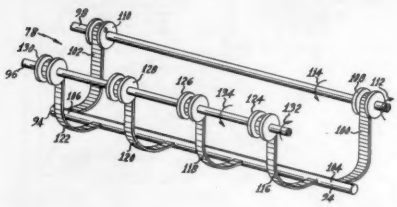
3,604,563
LUMBER SORTER

Michael P. Ronan, Jr., Citrus Heights, Calif., assignor to Moore Dry Kiln Company, Jacksonville, Fla.

Filed Jan. 28, 1970, Ser. No. 6,336
Int. Cl. B07c *5/38*
U.S. Cl. 209—74 **12 Claims**

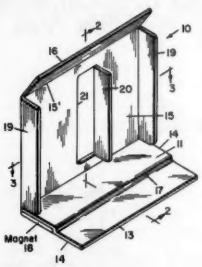
A drop sorter for lumber having a frame and plurality of lumber delivery bays and an unloading lumber accumulation sling assembly positioned within each delivery bay. Each sling assembly includes an elongated rigid element having opposite end portions and opposite side portions, a pair of flexible chains respectively supportingly connected to the opposite end portions of the element on one of its side portions

with means including a pair of drums connected to the frame for reeling in and paying out each of the pair of chains. Each assembly further includes a plurality of spaced flexible chains each having one of their end portions respectively supportingly connected to the element on its other side portion with means including a plurality of drums connected to the frame for reeling in and paying out each of the plurality of chains. The spacing distance between adjacent ones of the plurality of chains is less than the length of the boards being



delivered to the bay whereby the boards are supported on the plurality of chains between the element and the means for reeling the plurality of chains. The distance between the pair of chains is greater than the length of the boards being delivered to the bay whereby an accumulated load of boards are automatically unloaded from the plurality of chains through and between the pair of chains upon paying out of the pair of chains by their respective means for reeling and simultaneously lowering the element.

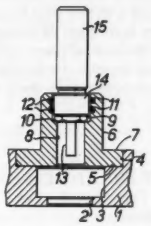
3,604,564
BOOK ENDS
Charles E. Weyll, Jr., P.O. Box 62, Glen Cove, N.Y.
Filed July 8, 1969, Ser. No. 839,849
Int. Cl. A47b *65/00*
U.S. Cl. 211—43 **1 Claim**



One piece of sheet material formed to provide a horizontal base with a vertical book-supporting panel at one edge of the base. An inclined ledge is provided at the upper edge of the panel and the side edges of the panel are formed with a pair of side flanges. A central flange is struck out from the panel midway between and parallel to the side flanges, and either of the side flanges may coact with the central flange to afford a pair of finger pieces for handling the book end. The base of the book end is equipped with a magnet for holding the same on metal shelving.

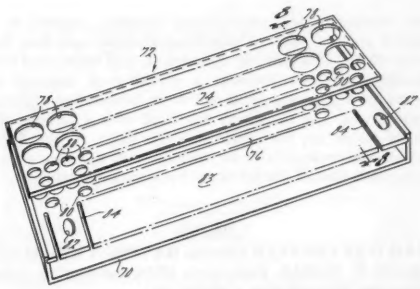
3,604,565
TOOL-HOLDING DEVICES
Richard T. Freeman, London, England, assignor to Molins Machine Company Limited, London, England
Filed Nov. 13, 1968, Ser. No. 775,478
Claims priority, application Great Britain, Nov. 15, 1967, 51,886/67
Int. Cl. B23q *3/155*
U.S. Cl. 211—60 **1 Claim**

A form of toolholder for holding a cutting tool in a tool magazine. The toolholder is internally and externally cylindrical and contains gripping means to grip a holdable portion of the tool. There is also disclosed a tool magazine having a plurality of stepped cylindrical holes of the same size each to



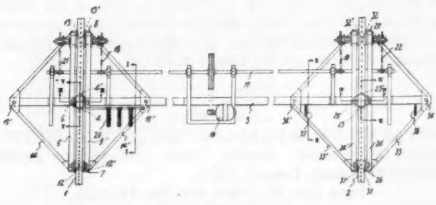
receive a toolholder. The internal diameter of each toolholder being appropriate for the diameter of the holdable portion of the cutting tool carried therein.

3,604,566
TEST TUBE HOLDER
Douglas J. Rem, 20525 Derby, Detroit, Mich., and David H. Smith, 18492 Alcoy, Detroit, Mich.
Filed May 1, 1969, Ser. No. 820,795
Int. Cl. A47b *73/00*
U.S. Cl. 211—74 **10 Claims**



There is herein disclosed a tube-carrying rack comprising an elongated, color-coded, U-shaped base with at least two upstanding sidewalls, track means disposed along the inner surface of the sidewalls, a tube-carrying support member, a plurality of apertures disposed within the support member and locking means associated with the base member and the support member to releasably retain the support member in a desired assembled relationship with the base member.

3,604,567
OVERHEAD TRAVELLING CRANE
Tatsumi Tanaka, 225-4, Zaimoku Chou, Saga, Saga Prefecture, Japan
Filed July 3, 1969, Ser. No. 838,879
Int. Cl. B66c *17/00*
U.S. Cl. 212—18 **5 Claims**



An overhead travelling crane comprises a hoist suspended from a girder which travels on two parallel I-rails which are perpendicular to the girder. The girder is suspended from

each rail by a carriage which consists of a pair of parallel bars, parallel to, below, and on opposite sides of the rails. These bars are connected at their centers by a shaft and at each end by links pivotally connected to each bar so as to permit limited relative motion between the bars. Each bar supports at each end a roller which rides on the lower flange of the rail. The bars form part of triangular frames which can swing slightly in a horizontal plane relative to the girder. The object of the arrangement is to permit the suspension system for the girder to accommodate itself to unevennesses of the rails.

3,604,568

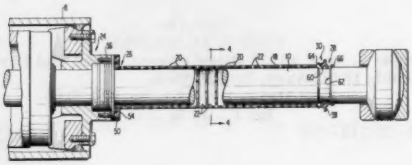
LUBRICANT FILLED BELLOWS FOR SHAFTS

Joe W. Dobkins, Fort Worth, Tex., and Halliburton Company, Duncan, Okla.

Continuation-in-part of application Ser. No. 751,608, Aug. 9, 1968. This application Sept. 1, 1970, Ser. No. 68,596

Int. Cl. B61g *9/08*

U.S. Cl. 213—43 **26 Claims**



An extensible and contractable bellows adapted to be mounted about a shaft. The bellows includes a hollow body portion that is substantially cylindricaL and unstressed when extended, and also includes a plurality of internal ribs adapted to engage the shaft and form lubricating chambers therebetween. The chambers are filled with a suitable fluid such as oil or air, for lubricating the shaft. A plurality of notched passageways or nibs, formed with the ribs, permits and controls flow of the lubricant between the chambers.

3,604,569

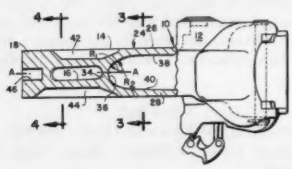
RAILWAY COUPLER SHANK HAVING A KEY SLOT

Frederick C. Kulieke, Tallmadge, Ohio, assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Aug. 20, 1969, Ser. No. 851,632

Int. Cl. B61g *9/00*

U.S. Cl. 213—62 **10 Claims**



The shank of a railway coupler is improved by better distribution of the metal surrounding the key slot. Forces due to buff and draft are distributed laterally across the shank to the butt and evenly to the top and bottom walls of the shank. The forces are then transmitted to the sidewalls proximate the leading surface of the key slot. Breakage and shortening of the shank proximate the butt is reduced.

3,604,570

APPARATUS FOR HANDLING DIE CASTING SHOTS

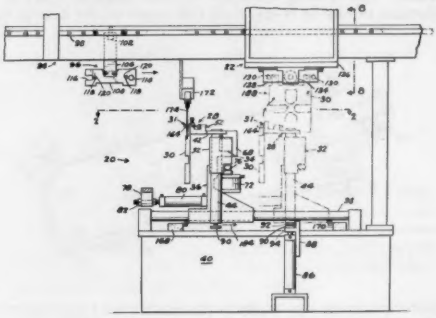
Herman M. Canner, Detroit, Mich., assignor to Sterling Detroit Company, Detroit, Mich.

Filed Apr. 16, 1969, Ser. No. 816,532

Int. Cl. B66c *1/66*

U.S. Cl. 214—1 BB **25 Claims**

Apparatus for removing a shot from a die casting machine and transferring it to a carrier. The shot is cast with studs extending in opposed directions from the shot and a pickup is placed between the open dies to receive and hold the studs on one side when the shot is ejected from the movable die. The pickup is removed from between the dies and rotated



and extended vertically upward to present the shot for transfer to the carrier by moving the studs axially so that the studs on one side of the shot are received and held by the carrier while the opposed studs are disengaged from the pickup.

3,604,571

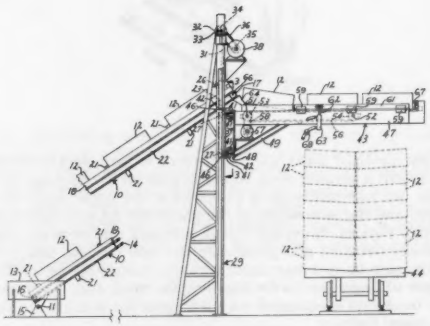
APPARATUS FOR TRANSFERRING LOGS TO CARRIER THEREFOR

Marvin C. Dobbs, Fayette, Ala., assignor to The Dobbs Co. and Alco Machine Shops, Incorporated, part interest to each

Filed Aug. 27, 1969, Ser. No. 853,300

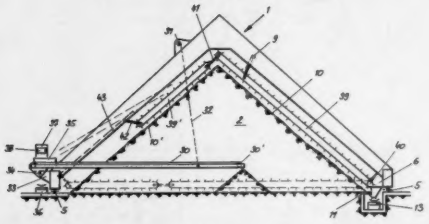
Int. Cl. B65g *57/112*

U.S. Cl. 214—6 G **1 Claim**



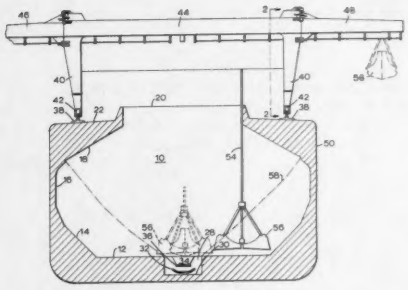
Log transfer apparatus having pivoted chute delivering logs sequentially to the receiving end of a conveyor extending transversely over and adapted for vertical adjustment relative to a subjacent supporting carrier. Relative horizontal movement between the carrier and the conveyor positions carrier for receiving logs along the length of the carrier. The logs are released onto the carrier by upstanding, pivoted plates in response to movement of logs a predetermined distance along conveyor.

3,604,572
COMBINED EQUIPMENTS FOR BUILDING UP AND CLEARING DUMPS OF BULK MATERIALS
Gunter Strocker, Holzwickede, and Gerhard Fischer, Dortmund-Kirchhorde, both of, Germany, assignors to Gustav Schade Maschinenfabrik
Filed Feb. 3, 1969, Ser. No. 795,873
Claims priority, application Germany, Feb. 12, 1968, Sch 44248
Int. Cl. B65g *65/28*
U.S. Cl. 214—10 6 Claims



A device for piling and unpiling bulk material includes a frame having spaced-apart base portions and legs extending upwardly toward one another from said base portions, a feeder conveyor is mounted on the frame for piling material in the space spanned by the base portions. The device includes a scraper boom for removing piled material from the area spanned by the base portions. An additional conveyor may be provided for receiving material from the scraper boom and for supplying material to the feeder conveyor by means of a trolley.

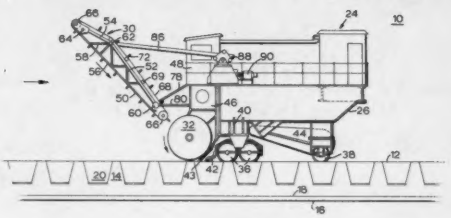
3,604,573
SYSTEM AND APPARATUS FOR UNLOADING BULK MATERIAL FROM A STORAGE ENCLOSURE
John Daniel Leitch, Toronto, Ontario, Canada, assignor to Upper Lakes Shipping Ltd.
Filed July 7, 1969, Ser. No. 839,247
Int. Cl. B63b *27/12*
U.S. Cl. 214—15 C 4 Claims



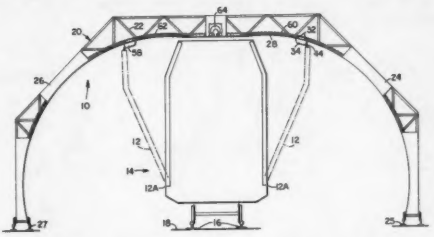
A system for unloading a bulk carrier has a flat-bottomed hold with a series of gates thereon to gravity-feed material on to a longitudinal conveyor positioned below the flat bottom; the unloading of the remaining material unaffected by gravity is completed by a deck-supported sling which moves across and along the hold.

3,604,574
APPARATUS FOR UNLOADING BULK MATERIAL FROM A STORAGE ENCLOSURE
John Daniel Leitch, Toronto, Ontario, Canada, assignor to Upper Lakes Shipping Ltd., Toronto, Ontario, Canada
Filed July 7, 1969, Ser. No. 839,354
Int. Cl. B63b *27/22*
U.S. Cl. 214—15 E 2 Claims

A wheeled reclaimer for dislodging material in the hold of a ship consisting of a frame which carries chain driven horizontally disposed spaced apart bars, the latter having outwardly disposed prongs which dig into the material on activation of the chains.

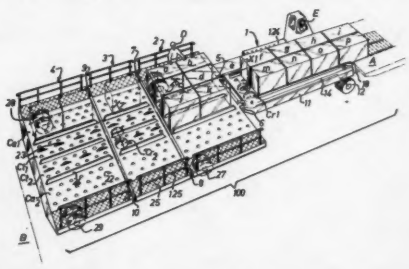


3,604,575
DOOR RAISING AND LOWERING MEANS FOR RAILWAY CARS
William M. Jaekle, 18 Tarry Lane, Orinda, Calif.; Paul V. Garin, 1836 Lake St., San Francisco, Calii.; William E. Thomford, 1176 Glenwood Drive, Millbrae, Calif.; Wallace M. Greb, 1139 Oakes Ave., San Leandro, Calif.; Nicholas N. Udaloff, 141-16th Ave., San Francisco, Calif., and Donald W. Bulloch, 1036 Central Ave., Alameda, Calif.
Filed Aug. 14, 1969, Ser. No. 850,174
Int. Cl. B65g *67/02*
U.S. Cl. 214—38 R 5 Claims



In conjunction with a railway car having doors on either side which pivot downward to an open position and upward to a closed position, carriages which run upward or downward along an arch over the car, the carriages being adapted to cooperate with top edge portions of doors to raise and lower them.

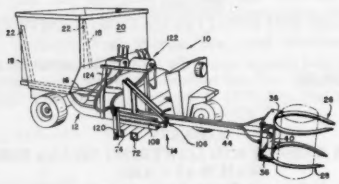
3,604,576
SELF-PROPELLED HANDLING TRUCK
Jacques Poccard, La Varenne, France, assignor to Nord-Aviation Societe Nationale de Constructions Aeronautiques, Paris, France
Filed Oct. 7, 1969, Ser. No. 864,489
Claims priority, application France, Oct. 8, 1968, 169.160
Int. Cl. B60p *1/52*
U.S. Cl. 214—38 D 8 Claims



A self-propelled truck comprising a control cabin permitting the distribution of loads between waiting zones and

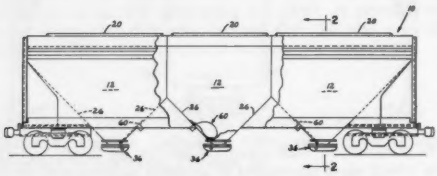
transfer zones, comprising at least two elements coupled to each other by articulated coupling joints and provided with displacement devices permitting at will lateral or turning movement in situ, a skewing plate and retractable guides.

3,604,577
CAN-LIFTING APPARATUS
Ludwig Otto Heilmeier, Rte. #1 Box 66, Waldorf, Md.
Filed Mar. 14, 1969, Ser. No. 807,181
Int. Cl. B65f *3/04*
U.S. Cl. 214—314 **3 Claims**



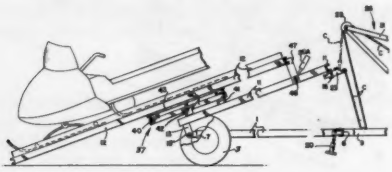
Material handling vehicle for lifting barrels, cans, as such, including a readily detachable lift mechanism unit having a boom and associated lift claws capable of universal movement.

3,604,578
UNLOADING ASSIST FOR COVERED HOPPER CARS
Garth R. Smith, Maryland Heights, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed Dec. 22, 1969, Ser. No. 886,815
Int. Cl. B60p *1/00, 1/56*
U.S. Cl. 214—500 **6 Claims**



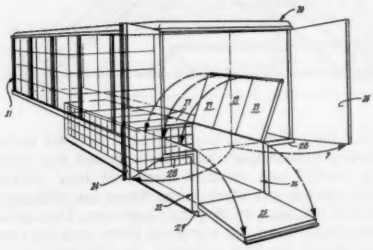
A gas inflatable bag is mounted on the slope sheet of a covered hopper car adjacent the bottom discharge outlet. The bag is secured along its upper marginal portion to the slope sheet and upon inflation bulges outwardly into the hopper. Upon deflation of the bag when a bulk commodity, such as potatoes, is carried by the hopper, the space previously occupied by the inflated bag is reoccupied by the bulk commodity thereby to aid in discharging any of the bulk commodity tending to bridge over the discharge opening.

3,604,579
TRAILER FOR SNOW VEHICLES
Roy A. Jenkins, 165 N. 28th St., Springfield, Oreg.
Filed Nov. 10, 1969, Ser. No. 875,320
Int. Cl. B60p *1/28*
U.S. Cl. 214—505 **10 Claims**



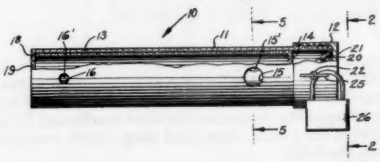
A trailer having a tiltable and rotatable bed for convenient loading and discharge of a load which for example may be snowmobiles as shown. A turntable supports the bed with the turntable being mounted particulate a tiltable framework movable relative to the trailer frame. A winch arrangement moves the trailer bed and tilting framework into and out of an inclined position incident to loading of the trailer. Bed retention means locks the bed to the trailer framework for travel means locks the bed to the tiltable for travel of the loaded trailer.

3,604,580
TRAILER WITH PORTABLE CONTAINERS
Harold R. Geister, 511 Francisco Blvd., San Rafael, Calif.
Filed Dec. 18, 1969, Ser. No. 886,074
Int. Cl. B60p *1/64, 3/10*
U.S. Cl. 214—515 **4 Claims**



A portable cargo container in combination with a generally U-shaped horizontal body frame of a trailer having two spaced parallel longitudinal frame members; the upper section of the container is wider than the space between said longitudinal frame members, and the lower container section is narrower than the space between said longitudinal frame members and is higher than the distance of said longitudinal frame members from the ground level so as to permit the longitudinal frame members to be backed under said upper section for loading; said lower section being adapted to serve as a base to support the container on the ground thereby to eliminate the need for multiplicity of trailers.

3,604,581
PILL DISPENSER HAVING SAFETY LOCK
Burt Van Iperen, Rte. #1, Hartley, Iowa
Filed Jan. 2, 1970, Ser. No. 5,386
Int. Cl. A61j *1/00;* **B65d** *55/02*
U.S. Cl. 215—9 **4 Claims**



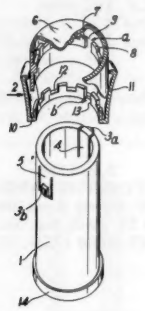
A device for dispensing pills, having an outer container with a screwcap and an inner sleeve. The container and the inner sleeve portion contain apertures which when rotated to alignment with each other allow passage of the pill from the interior of the device. The cap portion of the device also includes a method of locking the device closed in order to prevent access to the pills by children.

3,604,582

CONTAINERS FOR PROTECTING CHILDREN AGAINST DANGEROUS PRODUCTS

Pierre Boudin, 18 Rue St. Lazare, 75-9 eme, Paris; Maurice Liesse, Cite Diderot 94, Champigny-Sur-Marne, and Jean De Larebeyrette, 27 Rue St. Georges 75-9 eme, Paris, all of, France

Filed July 25, 1969, Ser. No. 844,832
Claims priority, application France, Dec. 5, 1968, July 29, 1968, 160,974; 176,742
Int. Cl. A61j *1/00*; B65d *55/02*
U.S. Cl. 215—9 18 Claims



The invention concerns method and containers for protecting children from dangerous products by enclosing said products in opaque container which can be opened only by a combination of at least two movements according to a nonobvious program counteracting the normal reflexes but is closed by simply translating movement, using normal instinctive reflexes.

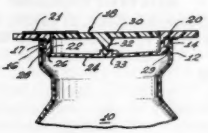
Container comprises moreover an independent auxiliary compartment provided with an easily removed closure and an element, sweet, fill, point etc.... which is unpleasant to at least one of the child's senses is disposed in it.

3,604,583

CONTAINER AND CLOSURE CAP THEREFOR

Robert P. Linkletter, 9372 Wilshire Blvd., Beverly Hills, Calif.

Filed Aug. 11, 1969, Ser. No. 848,833
Int. Cl. A61j *1/00*; B65d *55/02*, *43/10*
U.S. Cl. 215—9 9 Claims



A container having an inwardly directed shoulder forming a lower radial surface, and a closure cap therefor wherein the closure cap is provided with a depending flange portion adapted to fit within the mouth of the container and having a radial projection forming an upper radial surface adapted to cooperate with the lower radial surface carried by the container to thereby lock the closure cap to the container. Means are provided for flexing the closure cap to move the radial projection carried thereby out of engagement with the radial surface of the container to thereby release the closure cap. In an additional embodiment, a second depending flange is provided on the closure cap to prevent the cap from becoming contaminated when removed from the container, and in another embodiment, additional means are provided for maintaining the depending flange and radial projection carried by the closure cap in engagement with the corresponding radial surface carried by the container.

3,604,584

METHOD FOR PROTECTING GLASSWARE AND THE ARTICLE PRODUCED THEREBY

Herbert C. Shank, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed June 10, 1969, Ser. No. 831,939
Int. Cl. B65d *23/08*
U.S. Cl. 215—12 R 9 Claims

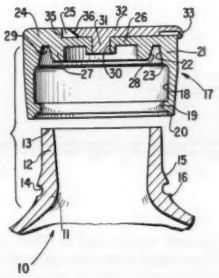
A method for protecting glass articles such as jars and drink bottles from abrasion. Broadly the method comprises heat shrinking a thermoplastic material around a portion of the glass article. The portion includes the sidewall-bottom wall region.

3,604,585

CONTAINER AND SAFETY CLOSURE SEAL THEREFOR

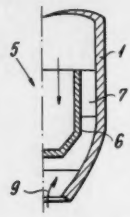
Edward J. Towns, 53 Mounthaven Drive, Livingston, N.J.

Filed May 7, 1969, Ser. No. 822,662
Int. Cl. B65d *23/00*, *53/00*
U.S. Cl. 215—40 6 Claims



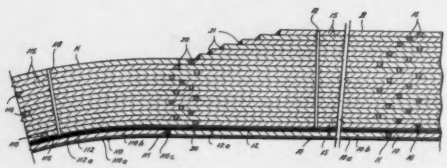
A squeeze-type or glass container and a safety closure therefor wherein the container and closure have portions that are interengageable in sealing relationship when the closure is mounted on the container neck to make the closure difficult to remove especially by children and the closure having a flush-fitted flap integral with it and resting in a recess in the top of the closure and on a partition at the bottom of the recess provided with at least one dispensing opening. The flap has an integral plug or bung or covering element to seal the opening in flush flap position. The flap may be swung from its flush position on the closure to an open position by a proper user to lift the plug or covering element and uncover the dispensing opening in the partition of the closure, the sealing fit of the closure or the container and the normally flush position of said flap making it very difficult it not impossible for children to lift the flap of the closure from its flush position or to remove the closure from the container, thus providing safe storage for dangerous container contents and preventing unauthorized access thereto.

3,604,586
CARTRIDGES CONTAINING CARBON-DIOXIDE FOR HOUSEHOLD PURPOSES
Lajos Baldauf, Bazakerettye; Imre Radnai, Repcelak; Janos Vasvari, Budapest, and Jozsef Wolf, Repcelak, all of, Hungary, assignors to Orszagos Koolaj Es Gazipari Troszt, Budapest, Hungary
Filed Apr. 1, 1968, Ser. No. 717,591
Claims priority, application Hungary, Apr. 14, 1967, OA-341
Int. Cl. B65d *17/00*
U.S. Cl. 220—3 **2 Claims**



The cartridges used for making soda water in the household are made, according to the invention, by a cold extrusion process in such a way that they have a pierceable diaphragm which is made in one-piece with the cartridge and is perfectly gastight at any climatic conditions. For filling the cartridges from the rear, their bottom part is closed by an elastic plug pressed by the inner pressure to an inwardly flanged part of the bottom of the cartridge.

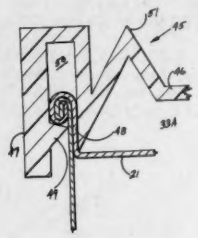
3,604,587
MULTILAYER PRESSURE VESSEL
Raymond E. Pechacek, Houston, Tex., assignor to Hahn & Clay
Filed Apr. 7, 1969, Ser. No. 814,126
Int. Cl. F17c *1/00*; **B65d** *7/42*
U.S. Cl. 220—3 **5 Claims**



A multilayer pressure vessel and method of making same wherein the vessel has both a multilayer cylindrical body and at least one multilayer head, with an inner shell being formed of stainless steel or other metal resistant to hydrogen embrittlement and with the multilayer body and multilayer head being provided with means for relieving hydrogen pressure in the layers externally of the inner shell, whereby the outer layers may be ordinary carbon steel for both the body and the head without danger of hydrogen embrittlement.

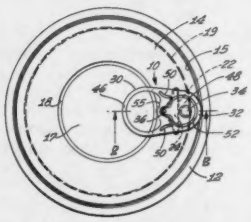
3,604,588
CAN COVER AND SEALER
Herman Winnick, 921 Valley Road, Bridgeport, Conn.
Filed Mar. 6, 1969, Ser. No. 804,913
Int. Cl. B65d *41/00*
U.S. Cl. 220—42 A **8 Claims**

This disclosure is directed to a cover and sealing member primarily for use on cans adapted to contain carbonated beverages or drinks which will go flat once the can has been opened. The cover and sealer comprises a member having spaced apart depending skirt portions to define a circumferentially extending channel with means for frictionally receiving therein the projecting lip portion of the can in sealing relationship therebetween. The cover member is specifically formed to prohibit loss of gas when placed over an



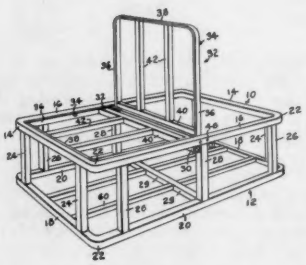
opened can wherein the pressure of the gas is utilized to enhance the sealing characteristics of the cover.

3,604,589
ANTIFRACTURE COIN FOR PANELLED CAN ENDS
Ermal C. Fraze, 355 W. Stroop Road, Dayton, Ohio
Filed June 27, 1969, Ser. No. 837,222
Int. Cl. B65d *17/24*, *51/16*
U.S. Cl. 220—54 **20 Claims**



An easy opening can end having a relatively large tear panel defined by a first rupturable score is weakened by a second inner nonrupturable score that takes part of the flexure of the can end that is caused by impacts of the contents of the can during shipment. In addition, the pull tab creates a large vent opening in the can end well before it initiates severance along the first score.

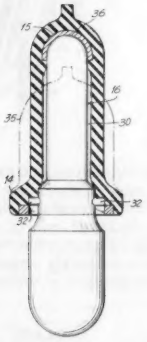
3,604,590
STACKABLE FRAME CHICKEN COOP WITH SLIDABLE BOTTOM MEMBER
Joe H. Jenkins, Horseshoe Bend, Franklin, Ark.
Filed Mar. 18, 1969, Ser. No. 808,157
Int. Cl. B65d *7/16*
U.S. Cl. 220—84 **7 Claims**



A chicken coop, particularly for shipping chickens and other fowl, is provided with a fabricated frame preferably formed of aluminum, the component parts of which are

preferably welded together. The bottom of the coop is formed by endwise slidable elements, and the top of the frame is made up of two doors or lids pivoted at their adjacent edges centrally of the length of the coop to swing upwardly. The body of the coop, when fabrication is complete, the bottom elements, and the door or cover units are dipped into a thermoplastic in liquid form. This plastic flows into crevices and corners and seals the construction against the entrance of dirt and bacteria to permit the coop to be steam-cleaned and sterilized without damage and with very little labor.

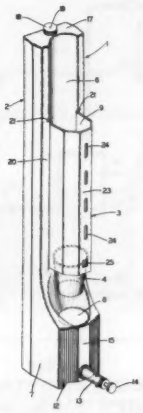
3,604,591
QUICK ACTION PLUGGING DEVICE
Harry Seltzer, East Meadow, N.Y., assignor to D & S Plug Corporation, North Bellmore, N.Y.
Filed Nov. 28, 1969, Ser. No. 880,597
Int. Cl. B65d *39/12*; **F161** *55/12*
U.S. Cl. 220—24.5 **11 Claims**



In a plugging device, for example, a plugging device in which an expandible stopper is adapted to be engaged by an expander movable along the longitudinal axis of the stopper to expand the stopper axially, the stopper has a bearing portion at the closed end thereof against which the expander bears as the expander is moved along the longitudinal axis of the stopper and the stopper is expanded, and a washerlike member is disposed substantially perpendicular to the longitudinal axis of the stopper adjacent the open end thereof; the washerlike member has an inner and an outer periphery and includes a slotted portion arranged along the inner periphery thereof, the slotted portion directly communicating with the outside of the stopper at the open end and being mateable with the expander and adapted for rapid insertion and removal of the expander in cooperation with the slotted portion to rapidly expand and contract the stopper; and said washerlike member further includes a lockable portion for locking the stopper in the axially expanded position, whereby the expander inserted through the mateable portion expanding the stopper longitudinally can be retained in the stopper in the rapidly expanded position. The expander includes an axially extending portion adapted at one end to expand the plug by axial insertion within the plug, and the axially extending portion includes at the other end a portion having circumferentially arranged protrusions extending therefrom in a direction transverse to the axis of insertion, the protrusions being adapted to pass through the slotted portion of the washerlike member and to be positioned so as to retain the expander within the plug in the inserted and expanded position.

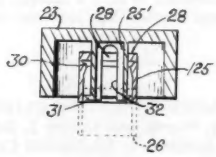
3,604,592
COMBINATION CUP AND LIQUID DISPENSER
Louis E. Bacon, North Canton, and Siegfried Garbe, Canton, both of, Ohio, assignors to Spartan International Corporation, Glendale, N.Y.
Filed Jan. 9, 1970, Ser. No. 1,821
Int. Cl. A47f *1/00*
U.S. Cl. 221—96 **9 Claims**

A combination cup and liquid dispenser with a tank body made of translucent preferably plastic material for dispensing a variety of liquids. The tank body has a service cap closing an access opening permitting easy cleaning and maintenance. A metal clip is removably mounted on the tank body forming



a cup holder and dispenser in cooperation with the tank body. The tank body and clip may be mounted inside a cabinet for normal use by a metal-retaining clip and may be removed easily for refilling and cleaning.

3,604,593
SAFETY CLOSURE EFFECTIVE BOTH IN THE CAPPED AND UNCAPPED STATE OF THE CONTAINER
Alfred Curci, 183 London Dr., Hamden, Conn.
Filed Jan. 27, 1969, Ser. No. 794,074
Int. Cl. G07f *11/00*
U.S. Cl. 221—288 **2 Claims**

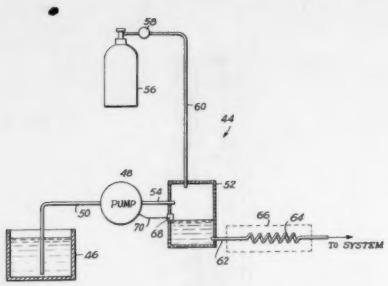


A dispenser, having a supply chamber, an outlet, and a discharge passage leading from the chamber to the outlet is provided in the passage with a normally closed trap which is resiliently distortable to open the passage for discharge of substance from the chamber. A cap has a formation projecting into the passage and distorting the trap when the cap is closed on the outlet.

3,604,594
PRESSURE PUMPING SYSTEM WITH SEALED PRESSURE CONTAINER
Jack Isreeli, Mamaroneck, and Aaron Kassel, Brooklyn, both of, N.Y., assignors to Technicon Corporation, Tarrytown, N.Y.
Filed June 4, 1969, Ser. No. 830,289
Int. Cl. B67d *5/08*
U.S. Cl. 222—64 **8 Claims**

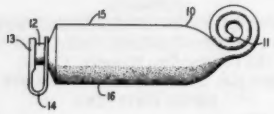
New and improved pressure pumping system with sealed pressure container is provided and comprises means to supply the fluid to be pumped to said sealed pressure container from a substantially open, nonpressurized source thereof, and means to pressurize said sealed pressure con-

tainer to pump said fluid therefrom. Means are additionally provided to maintain the level of said fluid within said sealed



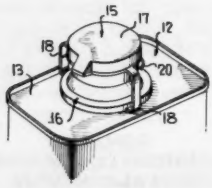
pressurized container substantially within a predetermined range.

3,604,595
SELF-COLLAPSING CONTAINER
John A. Wiedeman, 332 W. 37th St., New York, N.Y.
Division of Ser. No. 736,515, May 12, 1968, Pat. No. 3,478,480 which is a division of application Ser. No. 587,511, Oct. 18, 1966, now Patent No. 3,401,837
Filed Nov. 24, 1969, Ser. No. 879,242
Int. Cl. B65d *35/32*
U.S. Cl. 222—99 **7 Claims**



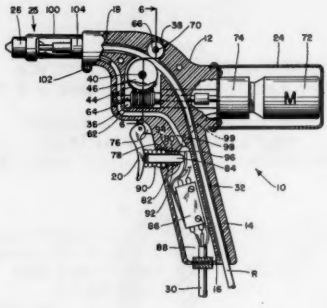
A self-collapsing thermoplastic container is constructed in such a manner that the walls thereof exert an internal pressure upon the contents in such a manner that upon opening of the discharge outlet the content material may be dispensed.

3,604,596
TAMPER-INDICATING CLOSURES
Nick S. Khoury, Worth, and Gareth J. Duggan, Crestwood, both of, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Jan. 17, 1969, Ser. No. 792,024
Int. Cl. B65d *41/32*; **B67d** *5/32*
U.S. Cl. 222—153 **5 Claims**



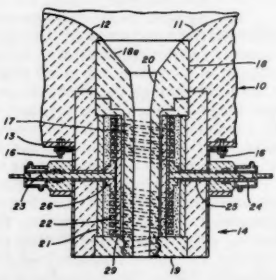
This disclosure relates to tamper-indicating closures of the type which include a nozzle and a closure cap. In order that tampering may be readily apparent, the closure cap is provided with one or more straps which have their opposite ends permanently secured to the nozzle in any desired manner. The straps are of a length so that when the closure cap is removed from the nozzle, rupture of the straps is required. The straps may be suitably weakened to facilitate the rupture thereof.

3,604,597
PLASTIC EXTRUSION DEVICE
Harold E. Pohl, Kankakee, Ill., and Kenneth M. Grout, Wakefield, Mass., assignors to General Mills, Inc.
Filed May 9, 1969, Ser. No. 823,365
Int. Cl. B67d *5/62*
U.S. Cl. 222—14 HE **14 Claims**



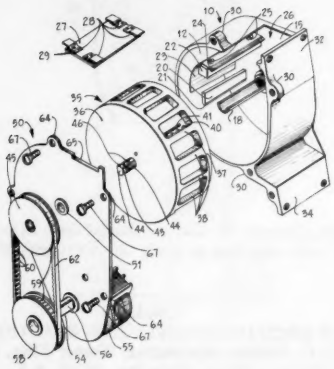
A dispensing gun for melting and extruding a thermoplastic rod material in a molten state. The gun includes a heated endpiece in which the material is melted, which is detachably connected to the discharge end of the gun, and a unique drive mechanism for advancing the rod material into the endpiece. The endpiece is readily removable for cleaning purposes, or for replacing it with a similar endpiece.

3,604,598
OUTLET PASSAGE CONSTRUCTION FOR TEEMING VESSELS
Keith K. Kappmeyer, Franklin Township, Westmoreland County, and James T. Shapland, Wilkins, Township, Allegheny County, both of, Pa., assignors to United States Steel Corporation
Continuation-in-part of application Ser. No. 698,514, Jan. 17, 1968, now abandoned. This application July 9, 1969, Ser. No. 840,215
Int. Cl. B65d *5/62*
U.S. Cl. 222—146 **5 Claims**



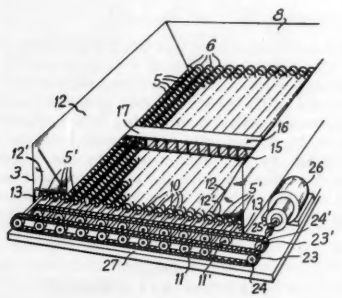
A bottom pour-teeming vessel in which the walls of the outlet passage are equipped with an electric-heating coil. The passage walls may be formed of a zirconia or 90 percent alumina liner and a sleeve surrounding the liner but spaced radially therefrom. The heating coil winds about the liner in the space between it and the sleeve and the remainder of the space is filled with alumina powder. A layer of thermal insulation encloses the sleeve. The sleeve is supported on a refractory nut threaded on the lower end of the liner.

3,604,599
APPARATUS FOR DISPENSING FLOWABLE MATERIAL
Ray S. Richmond, Placitas, N. Mex., assignor to The Singer Company, New York, N.Y.
Filed Mar. 9, 1970, Ser. No. 17,556
Int. Cl. G01f *13/00*
U.S. Cl. 222—252 10 Claims



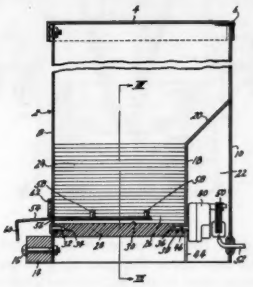
A squirrel cage dispenser for metering precise amounts of flowable material, such as toner powder used in electrostatic copiers. A cylindrical cage is mounted in a housing for rotation about an axis and has a concentrically mounted auger received by a split tube having an exit portion external to the housing. As the cage rotates, the material is elevated to the top of the housing interior by circumferential vanes, is allowed to cascade down onto the split tube, and is augered to the exit portion at a rate proportional to the rotational speed of the cage and auger.

3,604,600
PARTICULATE MATERIAL DISCHARGE FROM CONTAINERS
Andre Taupin, Nievre, France, assignor to Jean-Paul Taupin, Le Vivier, Urzy, Nievre, France
Filed Mar. 24, 1969, Ser. No. 811,687
Claims priority, application France, Mar. 27, 1968, 145,719
Int. Cl. B65g *33/10*; F16h *7/18*
U.S. Cl. 222—271 10 Claims



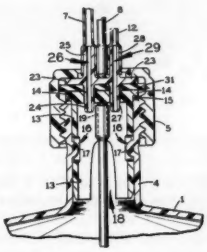
A device for the discharge of a particulate material from the bottom of a silo of the kind including a plurality of rotary helical members, for example springs, juxtaposed laterally at the bottom of the silo and leading to a discharge opening. In order to prevent any tendency to block lateral flow of the material, the bottom is flat and the space between adjacent helical members is less than the small thickness of a wall of powdered material which might support an arch of material thereabove.

3,604,601
FISH FEEDING APPARATUS
Gerald G. Boling, 816 Sixth Ave., Leavenworth, Kans.
Filed Sept. 23, 1969, Ser. No. 861,270
Int. Cl. A01k *61/02*
U.S. Cl. 222—305 6 Claims



A fish-feeding apparatus consisting of a hopper for containing a feed material for fish and having a restricted bottom opening disposed above the water level, a rotatable cylindrical dispenser member disposed horizontally in and obstructing said hopper opening, but having a groove formed longitudinally therein for receiving said feed material therein, means for rotating said dispenser cylinder, and a regulating shutter member disposed above said dispenser cylinder and movable longitudinally thereof to expose greater or lesser lengths of said groove to said hopper.

3,604,602
LIQUID SUPPLY CONTAINER FOR AN ATOMIZING SPRAY GUN
Aaron Lee, Miami Beach, Fla., assignor to Chemair Corporation of America, Hialeah, Fla.
Filed Feb. 26, 1969, Ser. No. 802,505
Int. Cl. B65d *83/14*
U.S. Cl. 272—400.7 3 Claims

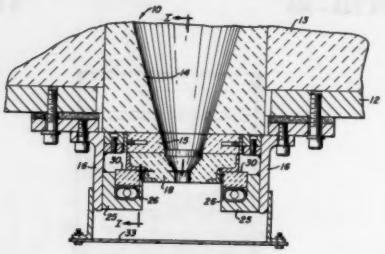


A substantially nonrefillable liquid container for an atomizing spray gun having a nonremovable closure for retaining a supply of liquid under the pressure of a remote supply of a gas propellant connected to the container with a closure insert detachably secured to the closure for removably connecting flexible tubes to the source of pressurized propellant conducting the liquid and propellant to the spray gun.

3,604,603
SUPPORTING MECHANISM FOR SLIDABLE GATE CLOSURES USED ON BOTTOM-POUR VESSELS
John A. Grosko, West Mifflin Borough, and James T. Shapland, Wilkins Township, Allegheny County, both of, Pa., assignors to United States Steel Corporation
Filed Sept. 24, 1969, Ser. No. 860,693
Int. Cl. B65d *47/14*
U.S. Cl. 222—561 3 Claims

A supporting mechanism for a slidable gate used as a closure for the nozzle of a bottom-pour vessel, such as a ladle or

tundish. The mechanism includes a pair of flexible tubes of oval cross section mounted along opposite sides of the nozzle, and pillow-shaped blocks placed on the tubes between



the tubes and gate. Internal pressure is applied to the tubes to bulge them and thus force the gate against the bottom of the vessel. The tubes yield to permit nonuniform thermal expansion and contraction.

3,604,604

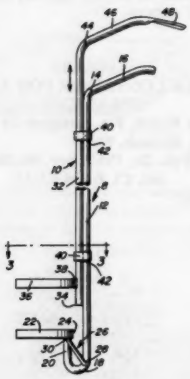
INVALID'S SOCK-HOLDING APPLIANCE

Albert D. Ahn, 244 Shoreview Dr., Pacifica, Calif.

Filed Feb. 24, 1970, Ser. No. 13,648

Int. Cl. A47j *51/06*

U.S. Cl. 223—111 **4 Claims**



For self-serving use by an invalid or a handicapped person, a manually grippable remote-controlled mechanical appliance which functions to releasably catch hold of a sock, align it with the foot and ankle and pull it to a ready-to-wear position. It comprises a pair of side-by-side reach members slidingly strapped together and implemented with squeezable handgrips and sock encompassing U-shaped jaws. Rigidifying braces and a shoehorn are provided to enhance the overall utility of the appliance.

3,604,605

TAPE-PUNCHING APPARATUS INCLUDING A BRAKING DEVICE

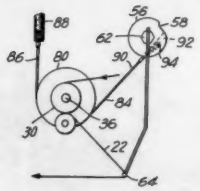
Howard Satterlee, Madeira Beach, Fla., assignor to New England Merchants National Bank, Boston, Mass.

Filed Apr. 17, 1969, Ser. No. 816,972

Int. Cl. B65h *23/18*

U.S. Cl. 226—25 **7 Claims**

A tape-punching apparatus including a source of tape, a punching mechanism, a drive to draw tape from the source and make the same available in a loop to the punching apparatus, a further drive to transport the thusly looped tape from the loop through the punching device, and detection means which senses the tension in the loop from which tape is driven by the second drive through the punching device. The detection means is effective to actuate the first-mentioned drive to replenish the loop when required. A brake is provided which is responsive to the detection means to apply



a braking force to the first-mentioned drive to avoid coasting of the same and thus to avoid an oversupply of tape to the loop.

3,604,606

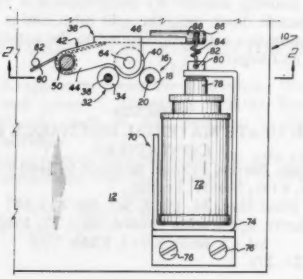
DRIVE MECHANISM EMPLOYING REACTION FORCES

Francis C. Marino, Huntington; Werner Flieg, Great Neck, and Herman Simon, Plainview, all of, N.Y., assignors to Digitronics Corporation, Albertson, N.Y.

Filed July 9, 1969, Ser. No. 840,320

Int. Cl. B65h *17/22*

U.S. Cl. 226—188 **5 Claims**



A drive mechanism for a tape deck and the like comprising a drive cylinder connected with driving means. A rotatable load cylinder is spaced from the drive cylinder and is adapted to be rotated in the same direction as the drive cylinder. A movable bracket rotatably supports a clutch cylinder which is adapted to be moved into contact with both the drive and load cylinders by the bracket whereby the reaction forces between the cylinders drive the clutch cylinder into further intimate contact with the drive and load cylinders. Moving means is provided to effect movement of the bracket.

3,604,607

CLEATING ATTACHMENT

Luther B. Jones, 1621 Green St., Columbus, S.C.

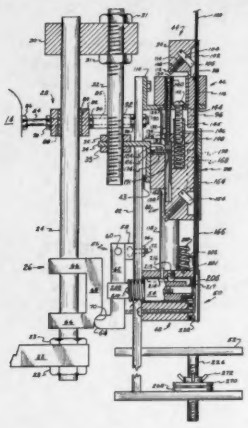
Filed June 3, 1969, Ser. No. 837,988

Int. Cl. B27f *7/02*

U.S. Cl. 227—97 **7 Claims**

An attachment having a driver block connected directly with the conventional punching machine. A check block and check-block holder are mounted at the top of upright supports which also support a foundation block and a punch that operates through the foundation block by an operator arm operated by a cam on the structure connecting the driver block to the punching machine. A feeder block is slidingly

mounted in the driver block and connected with the check block to feed the stock material the proper distance for the

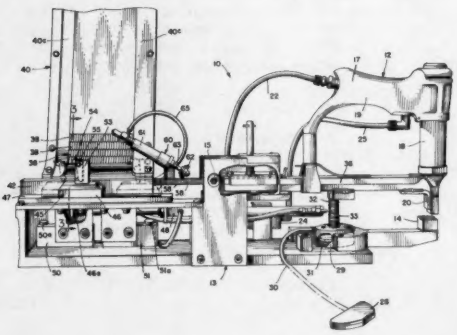


punch to cut a cleat of the desired length and the driver to force the cleat into any desired member.

3,604,608
FASTENER DRIVING APPARATUS

Frank W. Mullaney, Streamwood, and Glenn Hrdlicka, Des Plaines, both of, Ill., assignors to Fastener Corporation, Franklin Park, Ill.

Filed July 7, 1969, Ser. No. 839,192
Int. Cl. B25c *5/16*
U.S. Cl. 227—120 **6 Claims**

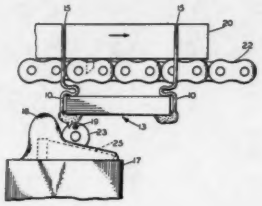


There is provided an improved automatic fastener driving apparatus having a fastener-feed construction for positively and rapidly providing fasteners to the fastener-driving apparatus. The fastener-feed construction includes a magazine feed wherein strips of detachable, connected fasteners are provided in side-by-side relation to a track feeding a fastener-driving tool. A first pusher is provided for pushing the strips of fasteners from a bin along the track, and movable through a return stroke to pick up another strip. A second pusher is provided engageable with a strip in the track during the return of the first pusher so that fasteners are continuously biased into the fastener-driving tool. Advantageously the fastener-driving tool is pivotally supported so as to be driven upon actuation into contact with a workpiece on an anvil, and the tool will automatically fire upon such actuation.

3,604,609
APPARATUS FOR ELIMINATING ICICLELIKE FORMATIONS ON WAVE-SOLDERED CONNECTIONS ON CIRCUIT SUBSTRATES

Edgar H. Walls, Allentown, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 621,701, Mar. 8, 1967, Pat. No. 3,465,415
Filed Dec. 2, 1968, Ser. No. 832,871
Int. Cl. B23k *1/00, 5/00*
U.S. Cl. 228—19 **10 Claims**

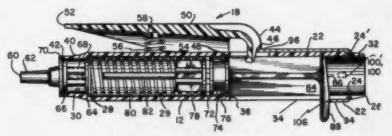


Iciclelike formations of solder which occur when a circuit substrate and associated conductive leads pass over a wave-soldering machine are reduced in size by passing the substrate over a fine stretched wire so positioned that a small space exists between the surface of the wire and the highest projection on the circuit substrate, breaking the surface tension of the formations.

3,604,610
DESOLDERING IMPLEMENT

William S. Fortune, 14250 Dearborn St., Panorama City, Calif.

Filed Feb. 16, 1970, Ser. No. 11,583
Int. Cl. B23 *1/00, 5/22*
U.S. Cl. 228—20 **11 Claims**



A small, hand-held desoldering tool having a spring-loaded piston carried within a cylindrical body member having a removable nozzle element at one end and being substantially open at the other. The piston has a finger-engaging cocking portion which extends radially outwardly through an elongate slot in the cylindrical body member and which permits axial motion of the piston for cocking and flyback. When in the cocked position, a trigger lever carried externally of the body member holds the piston in its forward position. Moving the trigger lever in one direction releases the piston for its flyback stroke and moving it in the opposite sense forces the piston further forward to eject the nozzle element from the body for cleaning or replacement. A rod member carried by the piston extends forwardly through the nozzle element to clean its bore with each cocking cycle. A reading of the complete specification is recommended for a full understanding of the principles and features of the disclosed tool.

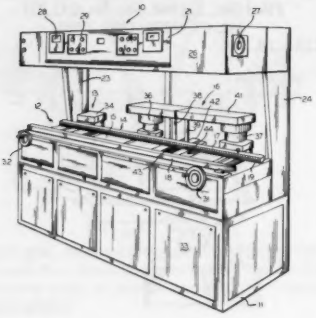
3,604,611
SOLDERING APPARATUS

John Lamberty, Des Plaines, Ill., assignor to Dee Electric Company, Chicago, Ill.

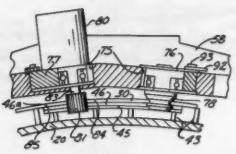
Filed Jan. 7, 1969, Ser. No. 789,562
Int. Cl. B23k *1/08*
U.S. Cl. 228—36 **12 Claims**

Automatic soldering apparatus that can be used for soldering printed circuit boards, or the like, of various sizes without

using pallets for transporting the boards between stations on the machine. Means are provided for varying the distance between the conveyor means used in transporting the boards between processing stations of the apparatus. Further means integral with the stations are provided for protecting the conveyors from solder and solder flux. The machine also provides means for energizing only those sections of the stations that are in use as determined by the size of the boards being processed. The improved apparatus further includes unique preheating arrangements.



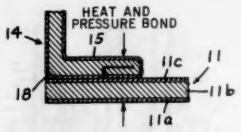
3,604,612
ORBITAL TRACK-TRAVELING CARRIAGE MECHANISM FOR PERFORMING WELDING AND OTHER PHYSICAL OPERATIONS
Ford S. Miller, and Jerome W. Nelson, both of Houston, Tex., assignors to CRC-Crose International, Inc., Houston, Tex.
Filed Oct. 1, 1968, Ser. No. 764,191
Int. Cl. B23k *37/02*
U.S. Cl. 228—45 **13 Claims**



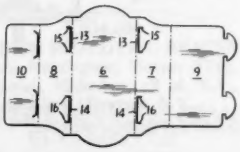
A traveling carriage adapted to support and guide a welding head or analogous tool is supported and guided on a flexible track arranged for securing in tension to and conforming with a supporting workpiece, such as a pipeline girth joint. The carriage has two widely spaced guide rolls on one side and a traction roll and closely positioned guide roll on the other. Multiple carriages, each carrying an arc-welder or equivalent, can be supported on a single track which, in turn, can be mounted on flat or other surfaces as well as cylindrical ones.

3,604,613
SIDE-SEAM-SEALED CONTAINER
Henry J. Haas, Scarsdale, N.Y., and Leon W. La Bombard, Nashua, N.H., assignors to International Paper Company, New York, N.Y.
Division of Ser. No. 628,709, Apr. 5, 1967, Pat. No. 3,495,507
Filed June 25, 1969, Ser. No. 862,098
Int. Cl. B65d *5/40*
U.S. Cl. 229—37 R **4 Claims**

A container for packaging fluids is made from a scored folded blank of coated paperboard. The container is made resistant to leakage by preventing the uncoated edge of a side-sealing panel from taking up fluid. This edge is protected by skiving a strip adjacent to the edge of the sealing panel, scoring the center of the skived strip and folding it on the scoring so that the skived faces are in intimate contact with each other. The container is folded from the prepared blank and seam sealed.

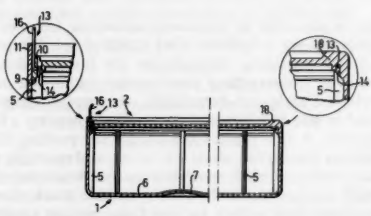


3,604,614
SLEEVE BLANK
Kenneth Michael Sternfeld, Hackensack, N.J., assignor to Lever Brothers Company, New York, N.Y.
Filed Sept. 5, 1969, Ser. No. 855,696
Int. Cl. B65d *5/02*
U.S. Cl. 229—40 **7 Claims**



A sleeve blank for holding at least one container of the type having a closure portion which protrudes outwardly beyond the external surface of the body thereof. The sleeve blank includes a top panel, two opposing downwardly foldable side panels extending from the top panel, a bottom panel extending from one of the side panels and an inwardly foldable locking panel extending from the other side panel for locking engagement with the bottom panel. According to the present invention, the two side panels are each provided with at least one first die cut arranged adjacent and extending parallel to at least one of the folded edges thereof. The side panels also have at least one second die cut arranged to terminate at and extending perpendicular to the first die cut. The die cuts on the two side panels are arranged in opposing relationship on the sleeve blank so as to permit the panels to expand at the points surrounding the closure portion of a container.

3,604,615
SEALED PACKAGING UNIT WITH TEAR STRING
Gustav Sigord Barreman, Mogard, Finspang, Sweden, assignor to Forvaltnings Aktienbolaget Acta, Bromma, Sweden
Filed Nov. 27, 1968, Ser. No. 779,547
Claims priority, application Sweden, Dec. 6, 1967, 16758/1967
Int. Cl. B65d *17/14*; **B65b** *7/28, 51/14*
U.S. Cl. 229—51 S **2 Claims**



A packaging unit made of thermoplastic material or paper, cardboard, etc. coated with such material and which includes a container having an opening and a lid covering said open-

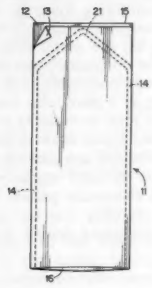
ing. The lid, having peripheral drainage holes therethrough is placed in the opening on one or more support surfaces on the container walls. The container rim encircling the opening is folded over and fused into consolidation with the peripheral portion of the lid to form a hermetical seal. A tear string may be provided about the periphery of the lid.

3,604,616

PEELABLE ENVELOPE FOR STERILE ARTICLES

Edward E. Greif, Philadelphia, Pa., assignor to Edward Weck & Company, Inc., Long Island, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,164
Int. Cl. B65d *33/02*; A61b *19/02*
U.S. Cl. 229—55 11 Claims



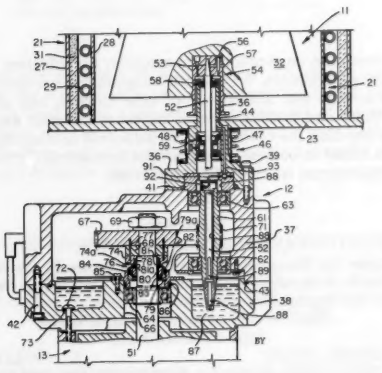
A sterilizable envelope for retaining articles before, during and after sterilization and for maintaining sterility of the contents for extended periods of time. One wall of the envelope is made of an opaque material, such as paper, and the other wall is a transparent material, such as a plastic film, these materials being sealed together around the periphery of the envelope. A portion of the periphery of the envelope is left open for receiving the article to be stored, whereupon the seal may be completed for subsequent sterilization and storage. Another portion of the periphery of the envelope is configured for easy opening by separating a portion of the two walls to expose the enclosed sterile article.

3,604,617

ULTRACENTRIFUGE TRANSMISSION ASSEMBLY

Williams G. Patterson, Palo Alto, Calif., assignor to Beckman Instruments, Inc.

Filed Apr. 9, 1969, Ser. No. 814,555
Int. Cl. B04b *3/00*
U.S. Cl. 233—23 7 Claims



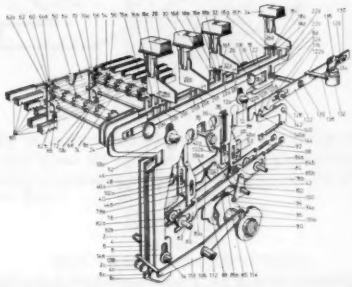
A transmission assembly for a high-speed centrifuge wherein the interior of the transmission is maintained under the same vacuum as the vacuum chamber of the centrifuge, with the dynamic vacuum seal being provided around the relatively slowly turning transmission input shaft.

3,604,618

TOTALIZER CONTROL APPARATUS

Gosta Roland Englund, Stockholm, Sweden, assignor to Svenska Dataregister AB, Solna, Sweden

Filed Dec. 22, 1969, Ser. No. 886,869
Int. Cl. G06c *21/00*
U.S. Cl. 235—60 MT 9 Claims



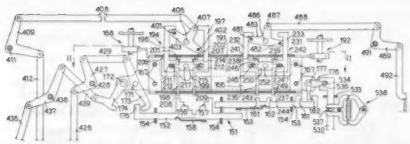
A totalizer control device for a cash register including coupling plates which control totalizers to be moved into engagement with totalizer racks during different points of time of a machine cycle. On each coupling plate there is slidably mounted a program slide with a pattern of parts turned against the totalizer selecting keys on the keyboard of the cash register. When depressing any of these keys one or several parts are affected to that one or several coupling plates control the movement of the totalizers. A lockable key is coupled to all slides and can relocate the slides so that a different pattern of parts will be turned against the totalizer selecting keys thereby permitting the totalizers to be controlled during other points of time of the machine cycle.

3,604,619

BIQUINARY CALCULATING MACHINE

Ettore Abbiati, Ivrea (Torino), Italy, assignor to Ing. C. Olivetti & C. S.p.A., (Torino), Italy

Filed Oct. 25, 1968, Ser. No. 770,555
Claims priority, application Italy, Oct. 30, 1967, 53546-A/67
Int. Cl. G06c *13/00*, *17/00*; G06f *5/02*
U.S. Cl. 235—61 PA 35 Claims



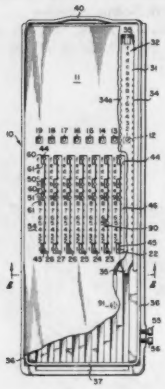
A biquinary calculating machine which includes a plurality of first code members, each settable selectively into two different positions to store the binary code digit of an order of a number and a corresponding plurality of second code members, each settable selectively into five different positions to store the quinary code digit of said order. The code members are arranged into a setting store and a totalization store. A tabular calculating device is provided for totalizing the numbers in the two stores and transferring the total back to the total store.

3,604,620

CALCULATOR FOR DIFFERENT NUMERICAL BASES

Rodney S. Rakes, 6918 Westhampton Drive, Alexandria, Va.

Filed Apr. 23, 1969, Ser. No. 818,744
Int. Cl. G06c *17/00, 27/00*
U.S. Cl. 235—69 **9 Claims**



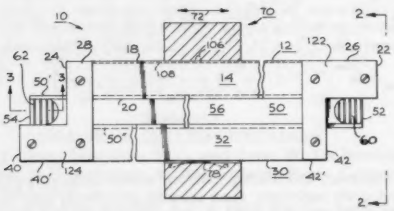
A calculating device for adding and subtracting quantities in at least two different base numerical systems of a type which has a plurality of sliding members for registering quantities which can be manually moved back and forth in grooves in the calculator housing. Digits inscribed on the sliding members register through sight openings in the face plate of the housing. Movement of the slide members is accomplished by inserting a pointed member through slots in the faceplate into selected notches provided in both sides of each sliding member. By moving the pointed member laterally in the groove, the sliding members likewise are moved. The carrying operation is accomplished through widened ends in each slot which limit the addition or subtraction in the next order of digits on the adjacent sliding member to one unit at a time. The numerical base system of the device is changed either by providing, in effect, different length slots, or by modifying the length of each slot—downwardly in both cases of the highest base number. Restrictive means are also provided to limit the movement of the sliding members so that only numbers of the base system involved can be displayed through the sight openings.

3,604,621

IMPROVED SLIDE RULE ARRANGEMENT

Walter S. Drummond, Jr., 4536 Santa Ana Street, Cudahy, Calif.

Filed Feb. 2, 1970, Ser. No. 7,602
Int. Cl. G06g *1/02*
U.S. Cl. 235—70 R **6 Claims**



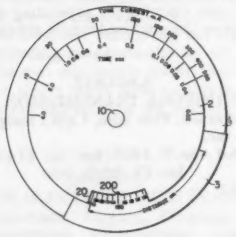
An improved slide rule arrangement having greater accuracy in reading the slide rule and information storage capability on the cursor of the slide rule as well as means for improving the ease with which the slide rule may be operated and adjusted is provided. The slide rule is of the type in which there is a top member coupled in spaced-apart relationship to a bottom member with a slide means slideably mounted intermediate the top member and bottom member and slideably moveable relative thereto. A cursor is mounted on the rule for sliding along the elongated length thereof and the cursor may have a magnifying indicator means on each face thereof and at least one extended planar surface extending therefrom upon which information such as formulas, tables of equivalents or the like may be imprinted or temporarily recorded. The planar surface may be permanently or detachably coupled to the cursor. The ends of the slide means, as well as portions of the cursor, may be provided with digit-engaging grooves and/or ridges to allow better gripping during movement thereof and also removable screws will be provided on cursor and body ends for possible readjustments. A permanent magnet may be included in the cursor and a strip of magnetic material for a cursor-runner may be provided on the top member or bottom member to obtain a preselected small restraining force for the cursor set in any position along the elongated length. There will also be the addition of a coating on the metal strip used to prevent or lessen static drag. The magnetic restraining force prevents small jarring forces from inadvertently moving the cursor and destroying the reading at a particular location. The different scales on the slide rule may be variably colored to aid in their reading and at least one linear scale is preferably included in which the divisions thereof are closely and equally spaced and the length of the division marks vary throughout the elongated length in a sinusoidal patter. The ends of the top member and bottom member may be oppositely offset from each other in the elongated length for more convenient handling.

3,604,622

ROENTGENOGRAM-TAKING CONDITION CONVERSION SCALE

Yoshihiko Yamada, 2-3-6 Ginza, Chuo ku, Tokyo, Japan

Filed Jan. 15, 1970, Ser. No. 3,150
Claims priority, application Japan, Jan. 22, 1969, 44/5609
Int. Cl. G06c *27/00*
U.S. Cl. 235—78 **3 Claims**



A condition conversion scale assembly for selecting proper exposure conditions for Roentgenograms is constructed of three coaxial disc scales, one of tube current, one of exposure time, and a third scale of exposure distance and combined together for conversion. By relatively turning the three scales about in common axis, proper conditions for taking a Roentgenogram is selected or converted.

3,604,623

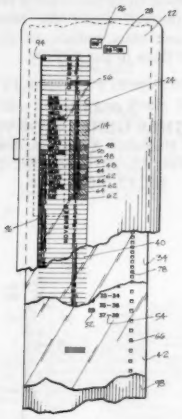
COITAL TIMING DEVICE

Lawrence M. Sherman, Westport, and James E. Richardson, Weston, both of, Conn., assignors to Cambridge Research and Development Group, Westport, Conn.

Filed Nov. 21, 1969, Ser. No. 878,623
Int. Cl. G06c *3/00*
U.S. Cl. 235—85 FC **22 Claims**

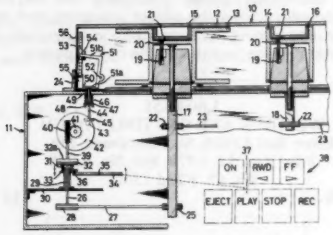
A coital timing device for determining the days in which coitus should occur in order to maximize the chances for conception. The timing device calculates the woman's fertile period based upon her past menstrual cycle history and then

indicates a coital timing period within which are displayed days for coitus and coitus abstention. A monthly calendar scale is provided to relate the coitus and coitus abstention



days to the actual days of the week and month. With appropriate marking of the coital timing period, the timing device can be used to minimize the chances for conception.

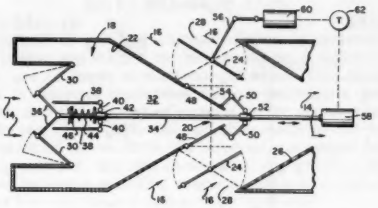
3,604,624
COUNTER FOR A TAPE RECORD-PLAYBACK MECHANISM
Yotaro Miura, and Yoshiharu Matsumoto, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed June 18, 1970, Ser. No. 47,195
Claims priority, application Japan, June 30, 1969, 44/62186
Int. Cl. G04b *37/00*
U.S. Cl. 235—103 **10 Claims**



A counter for use with a video tape recorder to indicate visually the amount of time the magnetic tape in a cassette has been used. After a predetermined number of revolutions of a wheel, a lever is tripped which rotates a gear having indicia thereon indicating the amount of time elapsed during which the magnetic tape was played.

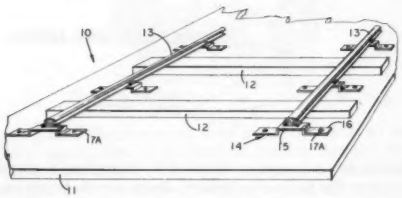
3,604,625
AIRFLOW MIXING DEVICE FOR AIR CONDITIONING SYSTEMS
William J. Waeldner, Waverly, Pa., assignor to Dynamics Corporation of America, New York, N.Y.
Filed Nov. 3, 1969, Ser. No. 873,524
Int. Cl. G05d *23/08*
U.S. Cl. 236—13 **12 Claims**

An airflow mixing device for "air reheat" air-conditioning systems comprising a primary air conduit with an airflow regulator having a pair of swingable variable-flow vanes and a pair of swingable constant-flow vanes. A variable area jet orifice is provided downstream of the regulator with an additional pair of swingable vanes and opposing induction air inlets are provided adjacent the orifice. All vanes are operated by one or more air motors under thermostatic control simul-



taneously to increase primary airflow and decrease induction airflow and when the latter is reduced to a minimum, valves in the induction inlets are closed to terminate completely the induction flow.

3,604,626
TOY TRACK CONSTRUCTION
Donald Marand, 542 Warcester Ave., Southbridge, Mass.
Filed Aug. 22, 1969, Ser. No. 852,241
Int. Cl. A63h *19/30*
U.S. Cl. 238—10 E **9 Claims**

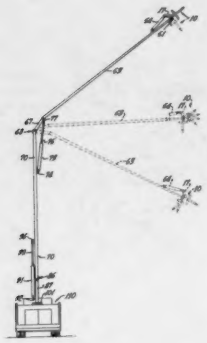


This disclosure is directed to a toy track construction and method of making the same comprising a base member to which a plurality of tie members are connected. A length of rail supported on these tie members is held in place by a plurality of rail clips spaced along the rail length so as to secure it to the base member in the spacing defined between adjacent pairs of tie members. The arrangement is such that the rail length is maintained in positive compressive relationship against the tie members. Means are also provided whereby the spacing or gauging of the tie members can be positively set and maintained during construction of the trackage.

3,604,627
MONITOR BOOM INCORPORATING TWIN-JET NOZZLE APPARATUS
John A. Miscovich, Flat, Alaska, and Leondras A. Warren, Whittier, Calif., assignors to Stang Hydronics Inc., Orange, Calif.
Filed Feb. 24, 1970, Ser. No. 13,349
Int. Cl. B05b *15/08*
U.S. Cl. 239—166 **11 Claims**

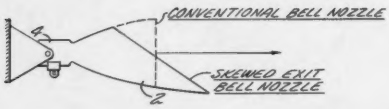
A remotely controlled twin-jet monitor apparatus is mounted on the end of an articulated water-conducting boom or arm, and is so constructed that the two jets emanating therefrom never create any resultant torque about the vertical axis through the mast for the boom. Accordingly, the boom may be made extremely large yet light in weight, and may be manipulated by small and low-power motor means.

Means are provided to effect simultaneous rotation of both jets, and to change the angles of the jets relative to a



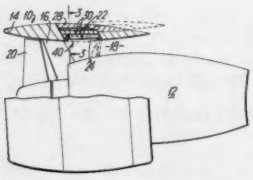
predetermined plane, but without creating the indicated resultant torque.

3,604,628
SKEWED EXIT PLANE NOZZLE SYSTEM FOR OPTIMUM THRUST
William D. Haynie, Jr., Lake Park, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Aug. 1, 1969, Ser. No. 846,772
Int. Cl. B64c *15/02*
U.S. Cl. 239—265.25 **8 Claims**



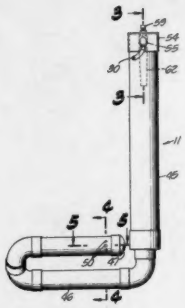
A nozzle arrangement formed by mounting a plurality of nozzles at the rear of a vehicle. Each nozzle being mounted for pivotal movement in a radial plane. Each nozzle is truncated at an angle other than 90° to the flow direction at the nozzle exit, whereby a skewed exit plane is formed. Control means are provided to rotate the nozzles about their mounting axes to obtain maximum performance for the ambient pressure the nozzle is operating in.

3,604,629
THRUST REVERSING MECHANISM
Francis J. Colville, Notts, England, assignor to Rolls Royce Limited, Derby, England
Filed Jan. 5, 1970, Ser. No. 1,071
Int. Cl. B64c *15/04*
U.S. Cl. 239—265.31 **14 Claims**



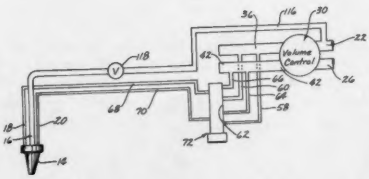
A ducted fan gas turbine jet propulsion engine has thrust reverser equipment in the fan cowl structure. Blocker doors or flaps are mounted peripherally of the fan cowl inner wall, and between adjacent blocker flaps there are fillet flaps also mounted so as to provide an uninterrupted surface in the fan cowl inner wall. The fillet flaps are pivotable on an axis generally parallel to the axis of the engine so that when the flaps are pivoted they lie edge on to fan air flowing through the reverser equipment. Each fillet flap has at least one side aerodynamically shaped so as to create a pressure differential on opposite sides thereof when the blocker flaps are in blocking position, and thus reduce or prevent "positional hunting" of the fillet flaps in the airflow.

3,604,630
AUTOMATIC LATHER GENERATOR AND DISPENSER
Nick Conti, 1954 N. Holliston Ave., Pasadena, Calif.
Filed Mar. 23, 1970, Ser. No. 21,772
Int. Cl. B05b *7/26*
U.S. Cl. 239—316 **24 Claims**



An automatic lather generator and dispenser for objects undergoing laundering, as motor vehicles, and including means for preparing and maintaining a nonpressurized supply of concentrated aqueous detergent solution. The solution is pressurized and intimately mixed with pressurized air before release and expansion as a thick stable lather into a closed storage chamber. The storage chamber is maintained full of fresh lather so that the formation of fresh lather displaces other lather through flow restrictor means onto the object undergoing laundering. Lather generation and dispensing is initiated automatically as the object advances and actuates control means governing the supply of pressurized air and detergent solution and terminates as the object passes.

3,604,631
WELDING AND CUTTING TORCH
Berwyn E. Etter, Box 11965, St. Petersburg, Fla.
Filed Jan. 12, 1970, Ser. No. 2,048
Int. Cl. F23d *13/38*
U.S. Cl. 239—414 **11 Claims**



A welding and cutting torch comprising a handle portion having a volume control valve rotatably mounted therein which is in communication with sources of industrial gas and oxygen. The volume control valve includes two valve portions which control the flow of gas and oxygen therethrough respectively. The two valve portions are coordinated with each other so that the operator can rotate the volume control valve to select the proper gas-oxygen mixture. The two valve portions are in communication with a master valve which permits preselected amounts of the gas-oxygen mixture to flow therethrough for lighting and heating operations. The

master valve may also be moved to an "off" position to prevent the flow of gas-oxygen mixture therethrough. The master valve is connected to the torch nozzle or tip. The torch also includes an oxygen line which bypasses the volume control valve so that additional oxygen can be supplied to the nozzle or tip when cutting operations are to be performed.

3,604,632

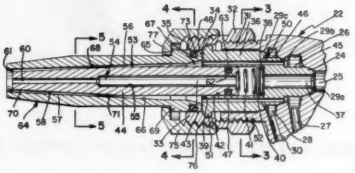
FLAME CUTTING TIP

Francis J. Eichelman, La Grange Park, Ill., assignor to The Golconda Corporation, Chicago, Ill.

Continuation-in-part of application Ser. No. 775,397, Nov. 13, 1968, now abandoned. This application Nov. 12, 1969, Ser. No. 875,744

Int. Cl. F23d *11/16*

U.S. Cl. 239—419.3 **19 Claims**



A flame cutting tip having its externally tapered core held resiliently in contact with an internally tapered sleeve to provide an improved heat exchange and sealing relationship in a radial direction between the parts which is readily released and assembled manually without tools for quick interchangeability of tips and parts along with the tactual feeling of terminal tightness during the last appreciable distance of relative movement.

3,604,633

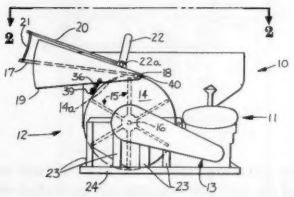
ONE-WAY SPREADER

Donald C. Estes, Rte. 4, Winchester, Ky.

Continuation-in-part of application Ser. No. 824,544, May 14, 1969, now abandoned. This application Jan. 7, 1970, Ser. No. 1,235

Int. Cl. B05b *1/26*

U.S. Cl. 239—513 **9 Claims**



Apparatus for distributing particulate material from a moving vehicle comprising a cylindrical housing, a plurality of impeller blades mounted for rotation in a vertical plane within the housing, means for feeding material into the lower part of the housing, an arcuate opening in the upper part of the housing, an elongated extension pivotally mounted to the housing at the upstream edge of the arcuate opening, the extension being movable about the pivotal mounting in a vertical plane, and a hood surrounding the extension at least on the top and two sides thereof.

3,604,634

COMMINUTION OF SOLID MATERIALS

William Windle, Saint Austell, Cornwall, England, assignor to English Clays Lovering Pochin & Company, Limited, Cornwall, England

Continuation-in-part of application Ser. No. 603,447, Dec. 21, 1966, now abandoned. This application Oct. 28, 1969, Ser. No. 871,963

Int. Cl. B02c *17/00, 23/06*

U.S. Cl. 241—16 **13 Claims**

A method of grinding calcium carbonate minerals, e.g. chalk, calcite and marble, in order to obtain a pigment suitable for use in paper coating compositions. The mineral is ground in aqueous suspension using a particulate grinding material, and the amount of mineral in the aqueous suspension, the size of the particulate grinding material, the relative proportions of the mineral, the aqueous suspension and the grinding material, and the duration of the grinding are adjusted to be within specified ranges in order to ensure that a pigment have the desired properties is obtained.

3,604,635

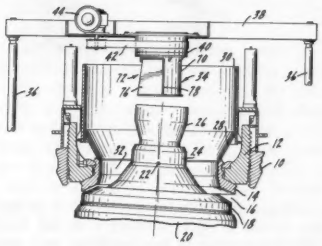
DISTRIBUTOR FOR CONE CRUSHERS AND METHOD

Rudolph J. Gasparac, West Milwaukee, and Arnold P. Szaj, Hales Corners, both of, Wis., assignors to Nordberg Manufacturing Company, Milwaukee, Wis.

Filed Apr. 14, 1969, Ser. No. 815,783

Int. Cl. B02c *2/04*

U.S. Cl. 241—30 **9 Claims**



A rotary feed distributor of such construction as to allow material to accumulate in the bottom portion thereof, but of such depth as to enable free and uncongested movement of the material to a gyratory crusher spaced therebelow. The distributor is a vertically arranged cylindrical chamber with an axial upper inlet and a lower, radially outwardly spaced outlet at least as large as the inlet. Accumulated material acts to protect the bottom surface of the distributor from wear. Additionally, wear plates are included on each side of the outlet.

3,604,636

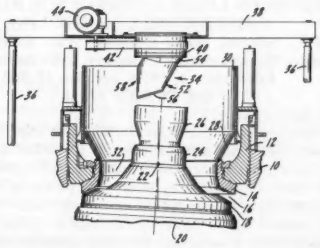
CONE CRUSHER FEED DISTRIBUTOR AND METHOD

Rudolph J. Gasparac, West Milwaukee, and Arnold P. Szaj, Hales Corners, both of, Wis., assignors to Nordberg Manufacturing Company, Milwaukee, Wis.

Filed Apr. 14, 1969, Ser. No. 815,948

Int. Cl. B02c *2/04*

U.S. Cl. 241—30 **10 Claims**



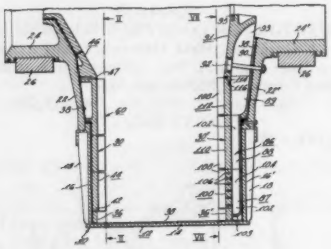
A rotary feed distributor for gyratory crushers which is designed to retain a dead bed of material therein. The bed of

material prevents abrasion of the distributor without restricting flow of material between the upper intake opening and the lower, radially outwardly spaced outlet thereof. The bottom of the distributor has bars affixed thereto to retain some feed material such that the wear-preventing dead bed is formed.

3,604,637
END LINER ASSEMBLY FOR ROTARY MILL OR THE LIKE

Richard E. Sabaski, Hales Corners, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Oct. 29, 1969, Ser. No. 872,294
Int. Cl. B02c *17/22*
U.S. Cl. 241—70 **17 Claims**



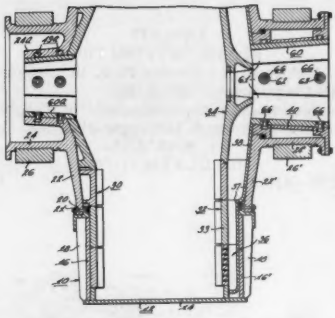
An end liner assembly for a rotary mill or the like in which the wear plates or liner members at the feed end, or the grates and wear plates at the discharge end, are assembled in a plurality of radially compressed pyramided tiers in stacked relation to each other. The radially outer end of the pyramided tiers is supported on the shell plate of the mill or on a filler ring supported thereby. The radially inner end of the pyramided tiers is engaged by a grinding pad(s) carried by a "pinned" liner member(s) or carried by another member(s) fixed with respect to the rotary mill, such as the discharge cone at the discharge end of the mill. The grinding pads are precisely dimensioned to provide the proper radial compression on the pyramided tiers of liner members. A supplemental clamping action on the liner assembly is provided by the lifter bars which are positioned between contiguous circumferentially spaced liner members in partially overlying clamping relation thereto. As an alternative to the use of grinding pads on the pinned liner of other stationary member, a wedge may be inserted in the clearance space between the radially inner end of the pyramided tiers of liner members and the contiguous radially outer edge of the pinned liner or other stationary member.

3,604,638
TRUNNION LINER ASSEMBLY FOR ROTARY GRINDING MILL OR THE LIKE

Richard E. Sabaski, Hales Corners, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Mar. 2, 1970, Ser. No. 15,566
Int. Cl. B02c *17/22*
U.S. Cl. 241—182 **15 Claims**

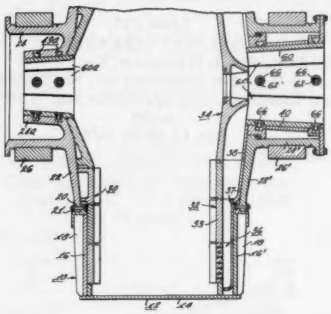
In a rotary grinding mill or the like the inlet and discharge trunnions of the mill are respectively provided with a liner assembly comprising a radially outer or primary liner and a radially inner or secondary liner. The primary liner normally remains permanently installed and is provided with a pair of axially spaced track slots of T-shaped cross section. The secondary liner is adapted for easy installation or removal and is secured to the primary liner by boltlike fastening means which are received in the T-shaped track slots of the primary liner. Instead of using a primary liner having track slots therein, the track slots may be formed directly in the trunnion, and the liner is secured by fasteners to the track slots.



3,604,639
TRUNNION LINER ASSEMBLY FOR ROTARY GRINDING MILL OR THE LIKE

Raymond C. Jenness, Milwaukee, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Apr. 1, 1970, Ser. No. 24,501
Int. Cl. B02c *17/22*
U.S. Cl. 241—182 **14 Claims**



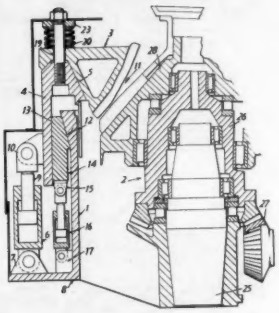
In a rotary grinding mill or the like the inlet and discharge trunnions of the mill are respectively provided with a liner assembly comprising a radially outer or primary liner and a radially inner or secondary liner. The primary liner normally remains permanently installed and is provided with a pair of axially spaced tract slots of T-shaped cross section. The secondary liner is adapted for easy installation or removal and is secured to the primary liner by boltlike fastening means which are received in the T-shaped track slots of the primary liner. Each track slot is provided with an access opening which permits initial engagement of the fastening means with the track slot. Instead of using a primary liner having track slots therein, the track slots may be formed directly in the trunnion, and the liner is secured by fasteners to the track slots of the trunnion.

3,604,640

HYDRAULIC CONTROL FOR GYRATORY CRUSHER

Roy Webster, Glenfield, England, assignor to Pegson Limited, Coalville, Liecestershire, England

Filed Mar. 4, 1969, Ser. No. 804,100
Claims priority, application Great Britain, Mar. 8, 1968, 11322/68
Int. Cl. B02c 2/04
U.S. Cl. 241—215 6 Claims



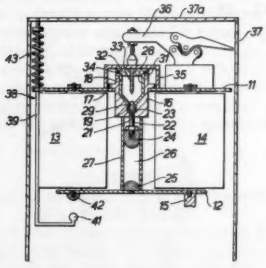
A gyratory crushing machine is equipped with hydraulic appliances for lifting and lowering the upper concave bowl relatively to the gyratory head, and thereby adjust the size of the crushing chamber, and for locking and centralizing the bowl in its adjusted position.

3,604,641

APPARATUS FOR HYDRAULIC CRUSHING

Joseph Dodman Wilson, Oxford; Bertram Reginald Donoghue, Didcot, and John Lester Waddingham, Abingdon, all of, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 2, 1970, Ser. No. 7,853
Claims priority, application Great Britain, Feb. 10, 1969, 7168/69
Int. Cl. B02c 19/18
U.S. Cl. 241—301 8 Claims



The apparatus is for crushing samples in preparation for analysis. A support vessel receives and supports a comparatively thin walled sample container, which may be filled and sealed separately from the crushing apparatus. A clamp clamps the sample container in the support vessel and effects electrical connection between electrodes molded in situ in the sample container and plates connected across capacitors for providing high-voltage pulses. The thin walled sample container is disposable so that cross-contamination is avoided by using a new sample container for each sample to be crushed.

ERRATUM

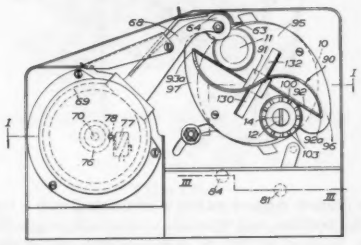
For Class 241—37 see:
Patent Nos. 3,604,645, 3,604,646

3,604,642

TEXTILE THREAD-WINDING APPARATUS

George Hirst, Dewsburh, and Brian Whiteley, Halifax, both of, England, assignors to Fairbairn Lawson Limited, Yorkshire, England

Filed May 1, 1969, Ser. No. 820,842
Claims priority, application Great Britain, May 3, 1968, 20996/68
Int. Cl. B65h 54/02
U.S. Cl. 242—18 A 31 Claims



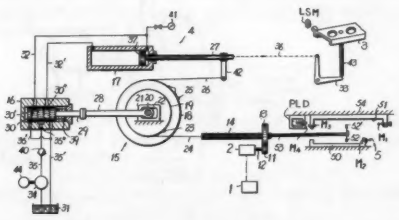
A textile thread-winding apparatus has a turret with two spindles each adapted to receive a thread carrier. The turret can turn to bring either of the spindles into the winding on station, and in so doing, it pushes a deflector into the path of the thread. The deflector guides the thread onto a catcher on the spindle at the winding on station, so that the latter begins to pick up the thread. The full package continues to rotate even at the reserve station until the trailing thread to the catcher is severed.

3,604,643

RING RAIL LIFTING METHOD AND EQUIPMENT FOR SPINNING MACHINERY

Tsuneo Kimura, Kusatsu-shi; Moriguchi, Tooru, Amagasaki-shi; Shigeaki Takahashi, Amagasaki-shi, and Katsumasa Nerio, Itami-shi, all of, Japan, assignors to Nihon Spindle Seizo Kabushiki Kaisha

Filed Aug. 11, 1969, Ser. No. 848,806
Claims priority, application Japan, Aug. 14, 1968, 57819
Int. Cl. B65h 54/36
U.S. Cl. 242—26.4 11 Claims



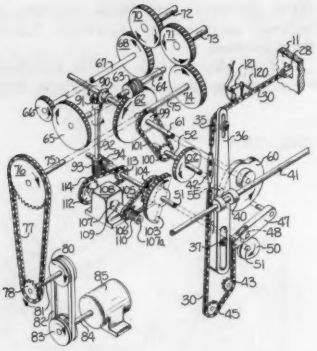
A ring rail lifting method and equipment for spinning machinery, comprising a pulse-generating device for generating pulses according to the rotation speed of a frame motor of a spinning machine or the like without receiving power from the frame, and a pulse motor operated by the pulse supplied from said pulse-generating device; and, said ring rail lifting method and equipment for spinning machinery characterized in that an interlocking mechanism operated by said pulse motor is arranged so as to give vertical motion to the ring rail, and this motion is controlled according to the counted number of the pulses transmitted from said pulse generating device.

3,604,644

WINDING CONTROL MEANS

Bobby R. Fain, Burlington, N.C., assignor to Alamance Industries, Inc., Burlington, N.C.

Filed Sept. 22, 1969, Ser. No. 859,636
Int. Cl. B65h 54/14
U.S. Cl. 242—32 6 Claims



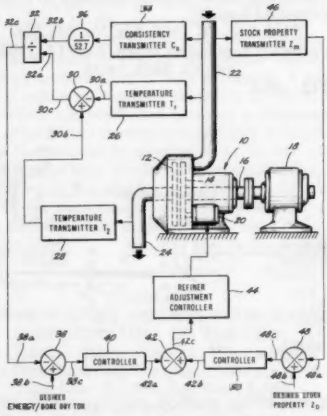
The present control means is associated with a high speed winding machine and operates to gradually move the center of the traverse stroke in one direction along the takeup packages so that the successive coils or layers of yarn form a filling-type wind. A speed reduction drive rotates a traverse control cam through one-half revolution during the winding of the packages, and a half gear repositions the traverse control cam upon completion of the winding of one set of yarn packages.

3,604,645

INFERENTIAL MASS RATE CONTROL SYSTEM FOR PAPER REFINERS

Marion A. Keyes, IV, South Beloit, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Dec. 10, 1969, Ser. No. 883,758
Int. Cl. B02c 7/14
U.S. Cl. 241—37 8 Claims



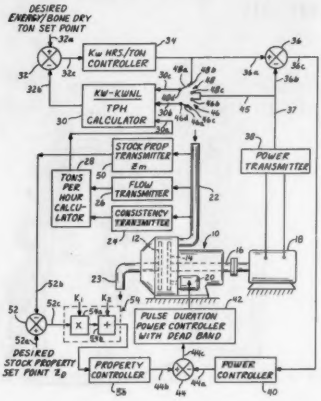
An inferentially derived kilowatt-hour-per-ton signal is provided by the measurement of differential temperature and consistency of the fluid stock flowing through the refiner. This signal is used to the motor that relatively positions the beater elements of the refiner to maintain a substantially uniform power consumption. Also, provision is made for modifying the action of the control motor in accordance with a given stock property of the stock flowing through the refiner to make prompt adjustment for changes in the particular stock property.

3,604,646

MASS RATE CONTROL SYSTEM FOR PAPER STOCK REFINERS

Marion A. Keyes, IV, South Beloit, Ill., and John A. Gudaz, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Dec. 10, 1969, Ser. No. 883,910
Int. Cl. B02c 7/14
U.S. Cl. 241—37 14 Claims



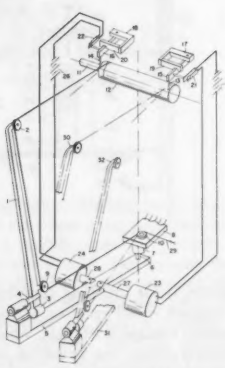
From consistency and flow data a signal is provided which is representative of the kilowatt hours per ton required to process the fluid paper stock passing through a refiner. This signal is compared with a desired set point and any difference is utilized as the set point for a power control loop. The function of the power control loop is to adjust the spacing of a longitudinally movable beater element contained in the refiner with respect to its stationary beater element. In this way, the power required by the drive motor that rotates the longitudinally movable beater element is maintained substantially uniform. The above action involves feedforward and feedback techniques. Additional feedforward correction is made for deviations in a preselected property, such as freeness, average fiber length and the like, of the incoming stock.

3,604,647

MACHINE FOR WINDING BOBBINS

George W. Le Compte, Rockville, Md., and Charles R. Seeger, Tucson, Ariz.

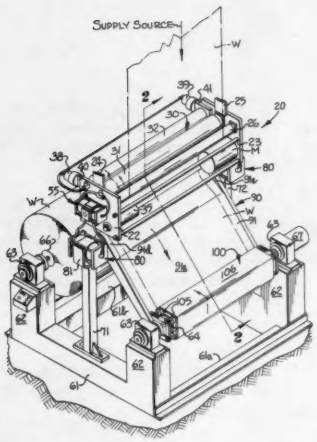
Filed Dec. 30, 1969, Ser. No. 889,114
Int. Cl. B65h 54/02, 54/28
U.S. Cl. 242—25 3 Claims



A machine for winding a bobbin with contiguous layers having contiguous turns of wire including a freely pivoted oscillating arm for delivering the wire to the bobbin. A pivot shaft on said arm connects the arm to a reversing plate which in turn is connected to a pivot shaft on a frame of the machine. The arm and the frame each carry a wire guide pul-

ley and the pitch circumferences of the guide pulleys are tangent to the axis of the pivot shaft on the arm. The axis of the pivot shaft on the frame is located in a manner that its axis intersects the axis of the bobbin.

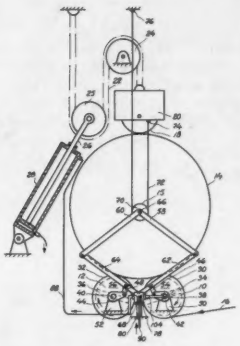
3,604,648
CONTINUOUS WEB HANDLING AND WINDING APPARATUS
William L. Schmidt, Gastonia, N.C., assignor to Colman-Cocker Company, Gastonia, N.C.
Filed Feb. 18, 1970, Ser. No. 12,320
Int. Cl. B65h *19/20*
U.S. Cl. 242—56 R **9 Claims**



An apparatus for selectively feeding, guiding, starting and winding a continuous web at a plurality of winding stations, including means for selectively feeding the web, means for severing the web to create a new leading end thereof, and at least a pair of spaced-apart mandrels for receiving and winding the web thereon. Guide means selectively guide a newly created leading end of the web toward a selected one of the mandrels and starting means responsive to the guide means selectively start the winding of the newly created leading end of the web around the selected one of the mandrels.

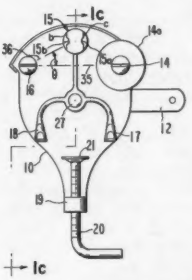
3,604,649
METHOD AND APPARATUS FOR WINDING UP TRAVELING WEBS
Gerhard Walter Dorfel, Riittulanmaki, Varkaus, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland
Filed May 14, 1969, Ser. No. 824,590
Claims priority, application Finland, May 15, 1968, June 26, 1968, 1363/68;1808/68
Int. Cl. B65h *17/08*
U.S. Cl. 242—66 **13 Claims**

This invention relates to a method and apparatus for winding a traveling web to form a cylindrical wound roll having a uniform winding tightness along the web width and between adjacent layers of the wound roll. A winding member is in pressure engagement with the generated surface of the wound roll along a meridian line thereof and is operable to produce the aforesaid uniform winding tightness. Positioned approximately diametrically opposite the aforesaid winding member is a loading roller operable to apply a variable force to the wound roll corresponding to the increasing weight of the wound roll such that the contact pressure between the wound roll and the winding member is maintained constant



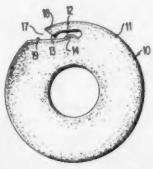
or varies in a predetermined manner in the winding operation.

3,604,650
UNIVERSAL TAPE WINDER
Gunnar Wennerberg, 1641 Poppy Way, and Paul Westin, 1523 Daphne Drive, both of San Jose, Calif.
Filed Oct. 23, 1969, Ser. No. 868,674
Int. Cl. B65h *17/06, 75/28*
U.S. Cl. 242—67.1 **3 Claims**



A device for winding tapes contains a plurality of spindles protruding from one face of the device housing. The end of a tape to be wound or rewound is drawn around one or more of the spindles and attached to another of the spindles. Rotating a handle protruding from the device housing rotates the spindle to which the tape is attached, thereby winding the tape on this spindle.

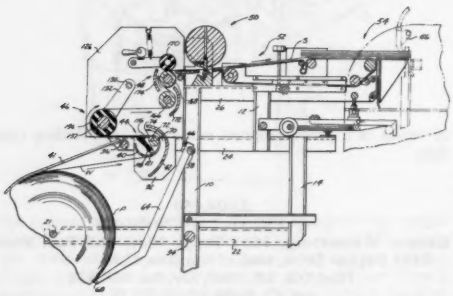
3,604,651
FILM TAKEUP CORE
Tadao Ohno, and Michiaki Wada, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara-Kamigun, Kanagawa, Japan
Filed Nov. 25, 1968, Ser. No. 778,522
Claims priority, application Japan, Dec. 7, 1967, 42/102964
Int. Cl. B65h *75/28*
U.S. Cl. 242—74 **3 Claims**



A film takeup core for a film magazine has a film end en-

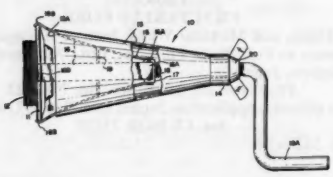
gaging groove on the periphery of the cylindrical body portion thereof. The groove has a protrusion on one inner surface for making a firm engagement with the film.

3,604,652
ROLL SHEETER FOR PRINTING MACHINE
Donald W. Sleeper, Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio
Division of Ser. No. 579,134, Sept. 13, 1966, Pat. No. 3,482,477
Filed July 2, 1969, Ser. No. 861,521
Int. Cl. B65h *23/06, 23/10*
U.S. Cl. 242—75.2 **5 Claims**



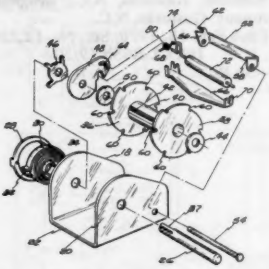
A web-decurling device for use with a roll sheeter attachment includes a rotatable bar having a sharp edge projecting into engagement with the outer surface of the web as it is unwound from a supply roll. The decurling device is self-adjusting in operation and comprises means for sensing the periphery of the supply roll and, in response to reduction in its diameter, continuously rotating the bar so as to change the attitude of the sharp edge to present an ever increasing amount of uniform decurling pressure to the web as the supply roll is depleted. Also provided is a tension control for maintaining the web taut and in effective contact with the sharp edge during operation, and for preventing web breakage and lateral runout of the web as it is unwound from the supply roll.

3,604,653
LINE-WINDING DEVICE FOR SPINNING REELS
George Anthony Sargent, P.O. Box 26, Veneta, Oreg.
Filed Mar. 17, 1970, Ser. No. 20,291
Int. Cl. A01k *89/00*
U.S. Cl. 242—84.2 R **4 Claims**



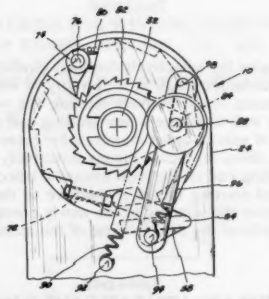
A device for attachment to the spool of a spinning reel is disclosed as having a plurality of diverging fingers for gripping the spool at circumferentially spaced-apart points. Additional means functions to secure the fingers on the spool for subsequent spool rotation for the winding of line onto the freely rotating spool while the reel bail remains stationary whereby twisting of the line is avoided.

3,604,654
AUTOMATIC SEATBELT RETRACTOR WITH SLIP CLUTCH
Robert W. Stoffel, Ferndale, Mich., assignor to Jim Robbins Seat Belt Co., Troy, Mich.
Filed Sept. 19, 1968, Ser. No. 760,918
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.4 **10 Claims**



An automatic seatbelt retracting device is disclosed having a slip clutch connecting the belt windup reel and a locking mechanism in an arrangement that allows a selected quantity of the belt to be extended from its fully retracted position, and then, in response to a partial retraction of the belt sets a locking pawl to restrict further rotation of the reel in its unwinding direction. A roller, mounted adjacent the reel, senses the belt as it is unwound from the reel from its fully retracted position and prevents the clutch from moving the pawl into locking engagement with the reel until a predetermined quantity of the belt has been extended from the reel.

3,604,655
INERTIA RETRACTOR
David P. Jones, Detroit, Mich., assignor to Allied Chemical Corporation, New York, N.Y.
Filed June 11, 1969, Ser. No. 832,353
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.4 **4 Claims**

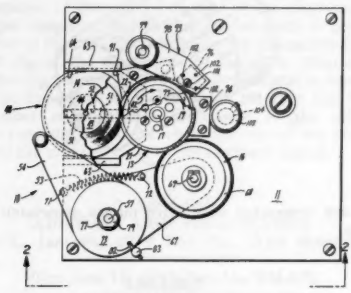


A safety seatbelt retractor having an actuator which releases a spring-biased pawl to lock the retractor reel in response to certain belt motions.

3,604,656
TAPE TRANSPORT APPARATUS AND CIRCULAR CARTRIDGE THEREFOR
Ashley J. Hollingsworth, 48 Maganite Rd., Atherton, Calif.
Continuation-in-part of application Ser. No. 773,843, Nov. 6, 1968, now abandoned. This application Oct. 27, 1969, Ser. No. 869,801
Int. Cl. G03b *1/04*; **G11b** *15/32, 23/04*
U.S. Cl. 242—192 **14 Claims**

Using a cartridge containing a roll of pliable recording tape wrapped upon a single hub and formed with a window at one

side of the cartridge, a tape transport apparatus feeds the cartridge into the loading slot of a tape player for movement progressively into the slot during playing of the tape. Rewinding the tape causes the cartridge to emerge progressively outwardly from the slot of the tape player. A multiple tape deck machine employs a number of readily removable tape deck units, each of which is disposed upon an associated one of a number of drive elements.



3,604,657

FILM END WITHDRAWING DEVICE

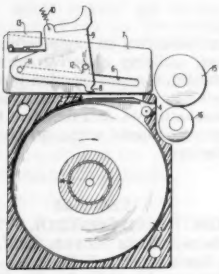
Shunkichi Igarashi, Tokyo, and Takeshi Okano, Hyogo, both of, Japan, assignors to Fuji Photo Film Co., Ltd.,, Ashigara-Kamigun, Kanagawa, Japan

Filed Nov. 18, 1968, Ser. No. 776,455

Claims priority, application Japan, Dec. 6, 1967, 42/78350

Int. Cl. G11b *15/66, 23/10*

U.S. Cl. 242—195 **6 Claims**



A pivotable, reciprocating plate having a hooked projection which enters a film magazine slot and is received within an aperture at the end of the film to forcibly withdraw the film end through an adjoining cartridge slot positioned in the path of the moving film strip end.

3,604,658

FISHING REEL DRIVE MEANS

Karl Nurmse, and Hugo Ragnvald Svensson, both of Svangsta, Sweden, assignors to ABU Aktiebolag, Svangsta, Sweden

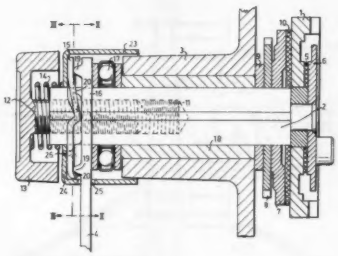
Filed June 11, 1969, Ser. No. 832,056

Claims priority, application Sweden, June 17, 1968, 8187/68

Int. Cl. A01k *89/00*

U.S. Cl. 242—218 **5 Claims**

A fishing reel drive means includes a friction coupling having a regulatable slip action in which the drag can be reduced by backward rotation of a drive crank in a direction opposite to that in which the crank is turned to wind a line onto a pickup drum. The drive means includes a crankshaft which is connected behind the inner end of a crankshaft hub formed on the mechanism housing with a driving gearwheel over a known friction clutch, the slipping action or drag force of which can be adjusted by varying the force of a spring which is mounted between the outer ends of the crankshaft and a sleeve surrounding said shaft and which provides for inward movement of the crankshaft and outward movement of the sleeve. The crankshaft supports on its portion projecting beyond the outer end of the sleeve, when viewed outwardly from said sleeve, firstly an axial ball bearing abutting the outer end of the sleeve, secondly a crank hub abutting the outer side of the axial ball bearing and having restricted rotary movement and guided for axial movement on the crankshaft, thirdly axial cam projections disposed on the outer face of the crank hub and arranged in uniform, spaced relationship around the shaft, fourthly a cam plate with axial cam surfaces and mounted on the end of the crankshaft for guided movement longitudinally but locked against rotary movement, said cam surfaces when turning the crank hub in the winding direction relative to the hub shaft and the cam plate cooperating with the cam projections to divorce the cam plate from the crank hub. The spring consists of an axial pressure spring which at its inner end bears against the outside of the cam plate and at its outer end bears against the head of an adjuster screw which is screwed into the outer end of the crankshaft.



3,604,659

METHOD OF DRAWING AND WINDING A THREAD OF ENDLESS FILAMENT AND APPARATUS FOR IMPLEMENTING SAME

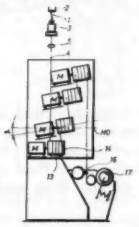
Rudolf Jaeggli, Bern, and Olivier Wust, Winterthur, both of, Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Apr. 23, 1969, Ser. No. 827,449

Claims priority, application Switzerland, Apr. 24, 1968, 6383/68

Int. Cl. B65h *54/02, 51/26*

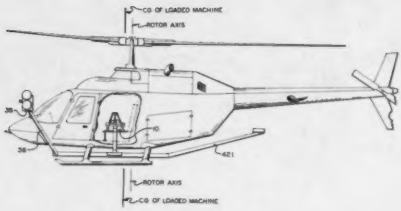
U.S. Cl. 242—35.5 R **22 Claims**



A method and apparatus are disclosed for high speed drawing and winding of endless filament threads wherein the threads are passed over a plurality of pairs of draw rollers, each pair being vertically and axially offset with respect to the preceding and following pairs. In addition, each pair of rollers with the exception of the first and lowest pair has its axis inclined with respect to the horizontal to reduce the overall dimensions of the apparatus. After passing from the final pair of rollers, the thread is traversed at a distance from the final pair of at least six times the width of traversal, and is wound upon a suitable roller. Two or more parallel threads

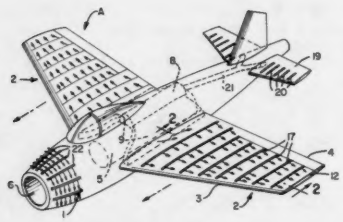
may be simultaneously processed by the draw rollers and then individually traversed and wound.

3,604,660
HELICOPTER SENSOR PLATFORM ASSEMBLY
Eugene I. Marley, Kirkwood, N.Y., assignor to Rotorcraft Gyro Support System, Inc., Callicoon, N.Y.
Filed Dec. 4, 1969, Ser. No. 882,014
Int. Cl. B64c *27/00*
U.S. Cl. 244—17.11 **18 Claims**



A plurality of load platforms which may carry sensing devices or counterbalance weight are carried externally of the cabin of a helicopter on a rigid frame which extends inside the helicopter fuselage and is carried on a gyrostabilized gimballed suspension with the gimbal axes near the helicopter center of gravity.

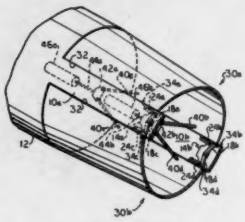
3,604,661
BOUNDARY LAYER CONTROL MEANS
Robert Alfred Mayer, Jr., 7727 Miller Fall Road, Rockville, Md.
Filed Sept. 25, 1969, Ser. No. 861,042
Int. Cl. B64c *21/04*
U.S. Cl. 244—42 **6 Claims**



A vehicle movable through a fluid supporting medium includes an active system for controlling the layer of said fluid over at least a portion of the vehicle exterior surface. Parallel slots through the surface permit fluid under pressure to issue over the surface to reduce drag and improve lift and/or propulsion.

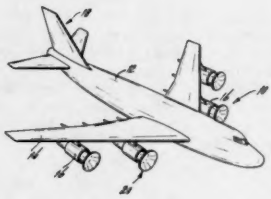
3,604,662
THRUST-REVERSING APPARATUS FOR JET-PROPELLED AIRCRAFT
Harold E. Nelson, Jr., Chula Vista, and Ralph O. Brannon, La Mesa, both of, Calif., assignors to Rohr Corporation, Chula Vesta, Calif.
Filed Jan. 19, 1970, Ser. No. 3,727
Int. Cl. B64c *15/06*
U.S. Cl. 244—53 R **4 Claims**

Each of a pair of thrust-reversing doors is connected to an aircraft jet-engine housing by six links, two of which pivot about a first axis disposed transverse to the longitudinal axis of the housing, two of which pivot about an axis disposed laterally of said first axis and parallel therewith, and two of



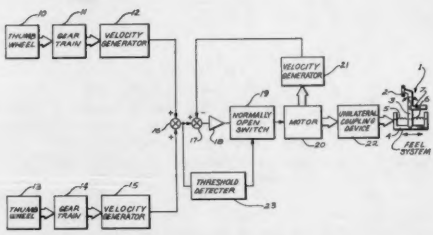
which are connected with drive means associated with the housing.

3,604,663
JET ENGINE THRUST ENHANCER
Willard R. Custer, Hagerstown, Md., assignor to Custer Channel Wing Corporation, Hagerstown, Md.
Filed July 15, 1969, Ser. No. 841,856
Int. Cl. B64d *33/02*
U.S. Cl. 244—53B **5 Claims**



Apparatus for enhancing jet engine efficiency and creating increased thrust, utilizing effective created pressure differentials to establish forward reaction thrust. The apparatus basically consists of a bell-shaped member disposed forward of the engine intake throat. In a modified form a partial bell-shaped member is combined with a lift channel for increased operating efficiency.

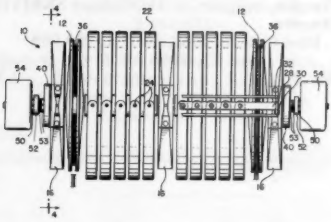
3,604,664
POSITIONAL CONTROL SYSTEM
Francis J. Mahoney, Santa Monica, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Aug. 21, 1969, Ser. No. 852,002
Int. Cl. B64c *13/12*
U.S. Cl. 244—84 **32 Claims**



A control system in which an output member is positioned so its displacement is proportional to the displacement of a plurality of input members. Signals are generated that have a characteristic, e.g., amplitude or pulse-repetition rate, representative of the rate of change of the displacement of the input members. The signals are combined so the charac-

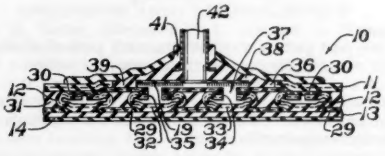
teristics add. A feedback signal is generated that has a characteristic representative of the movement of the output member. The output member is positioned responsive to the combined signal and the feedback signal such that the displacement of the output member is proportional to the sum of the individual displacements of the input members. In one embodiment, the characteristic of the feedback signal is representative of the rate of change of the displacement of the output member, and the output member is positioned responsive to the difference between the characteristic of the feedback signal and the combined signal. In other embodiments, the characteristic of the feedback signal is representative of the displacement of the output member, and the output member is positioned responsive to the difference between the integral of the characteristic of the combined signal and the characteristic of the feedback signal.

3,604,665
AIRCRAFT ARRESTING SYSTEM
Truman K. Jamison, 1019 Pike St., Crest Hotel, Seattle, Wash.
Filed June 19, 1969, Ser. No. 834,670
Int. Cl. B64f *1/02*
U.S. Cl. 244—110 **4 Claims**



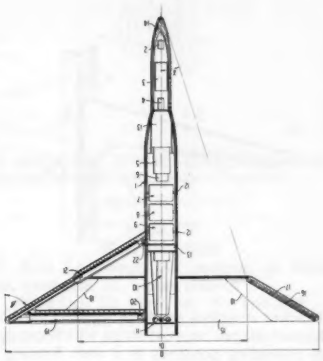
A plurality of spiral springs are secured to a frame mounted below an aircraft runway. The springs are fixed to a rotatable shaft upon which a pair of cable drums are secured. Cables are fed from the drums onto the runway surface in positions to be engaged by loops protruding from an aircraft. Brakes are provided to prevent the springs from accidentally unwinding after the airplane has come to a stop. Motors are provided to wind the springs so that the system may be employed to catapult aircraft from the runway. Several springs and cable arrangements are illustrated.

3,604,666
PNEUMATIC DEICER
Melvin B. Achberger, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.
Filed Aug. 25, 1969, Ser. No. 852,769
Int. Cl. B64d *15/16*
U.S. Cl. 244—134 A **5 Claims**



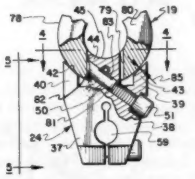
A pneumatic deicer having a series of inflatable tubes which are alternately extended by inflation to break up ice accumulations in which the tubes are interconnected by plies of porous fabric having spaced projecting elements providing interstices through which air passes and sealing members adhered to the plies and tubes at the openings to provide an airtight assembly.

3,604,667
PLANETARY LANDER
Carlos de Moraes, Littleton, Colo., assignor to Martin Marietta Corporation, Baltimore, Md.
Filed Nov. 26, 1968, Ser. No. 778,933
Int. Cl. B64d *1/00*
U.S. Cl. 244—138 **17 Claims**



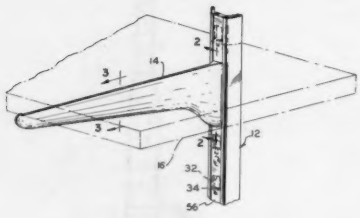
A drag ring penetrometer combination of the type employed for determining the atmospheric and surface characteristics of planets, the drag ring aerodynamically stabilizing and decelerating the penetrometer during its planetary entry to thereby permit continuous transmission of communication during entry and to reduce the aerodynamic heating of the penetrometer, and also to thereby permit a desired amount of oriented penetration into the planet surface.

3,604,668
CLAMPING MECHANISM FOR ASSISTING IN MEASURING MACHINE QUILL TRAVEL
Karl Bernhardt, 628 Euclid St., Santa Monica, Calif.
Filed June 12, 1969, Ser. No. 832,593
Int. Cl. B23q *11/00*
U.S. Cl. 248—223 **10 Claims**



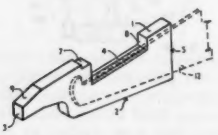
A clamping mechanism has a block formed with a lug and a pair of parallel arms spaced upon opposite sides of the lug. Extending obliquely across the longitudinal centerline of the lug is a locking pin that is coaxially aligned with a force-transmittting screw coupled to the block. The screw has an inner end engaged against the locking pin and an outer end positioned at a convenient location so that a machinist or the like may easily reach the screw in order to drive the pin to its locking position. To tightly clamp the clamping mechanism against a curved body formed with a bore, the lug is positioned within the bore with at least one arm held aligned against the body periphery. The locking pin is driven against a bore wall location and at least one abutment shoulder formed by the lug is simultaneously driven against another bore wall location.

3,604,669
SHELF BRACKET STRUCTURE
Glen M. Asher, Lake Oswego, Oreg., assignor to Western Wood Mfg. Co., Lake Oswego, Oreg.
Filed Oct. 27, 1969, Ser. No. 869,820
Int. Cl. A47g 29/02
U.S. Cl. 248—243 5 Claims



A shelf bracket structure made of molded plastic material includes channel-shaped support strips which can be secured in vertically extending positions to a wall. Bracing elements extend across the channels and divide the channels into equally spaced elongated recesses in the back of the strips. An opening extends through the front wall of each strip into each of the recesses. Shelf brackets each have on one end an upper hook element received in one of the openings and a lower bracket-aligning projection received in the next lower opening. There is a lateral movement stabilizer for each bracket. In one form of the invention, the stabilizer comprises a pair of lugs on the rear of the strip between which the hook of a bracket slides. In another form of the invention, the stabilizer comprises a tang on the aligning projection, receivable in a narrow slot extending downwardly from each opening. Ends of the strips are formed to overlap each other and end elements cover exposed ends of the strips.

3,604,670
SHELF BRACKET ADAPTER
Thomas Herbert Reeves, Scarborough, Ontario, Canada, assignor to FMP Fabricating Limited, Toronto, Ontario, Canada
Filed May 20, 1970, Ser. No. 39,017
Int. Cl. A47g 29/02
U.S. Cl. 248—250 5 Claims



A bracket adapter for use with any type of blade shelf bracket to aid in supporting a shelf; the adapter being in the nature of a sheath that is slipped on the outer end of a shelf bracket, having a recess on its upper side to nest a reinforcing channel on the underside of the shelf and a projecting nose for engagement of the shelf front return whereby the bracket-supported shelf is provided assured stability as the shelf-reinforcing channel nested in the adapter's recess prevents the forward displacement of the shelf and the shelf front return hooked under the adapter's projecting nose precludes any accidental upward displacement of the front edge of the shelf.

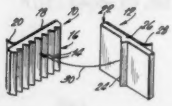
3,604,671
CYCLE HELMET COLLAPSIBLE COMPARTMENT
R. C. Walker, 713 Highland Parkway, Norman, Okla.
Filed Oct. 21, 1969, Ser. No. 868,119
Int. Cl. B65d 7/24
U.S. Cl. 248—309 6 Claims

Three concentric rings are diametrically interconnected for pivoting movement of the two inner rings and positioning the respective rings in planes perpendicular with respect to each other to form an open frame cage.

3,604,672
SUSPENSION DEVICE FOR TEACHING AIDS AND THE LIKE
Bengt H. Askesjo, Sollentuna, and Knut Inge Nyhlen, Malmo, both of, Sweden, assignors to Aktiebolaget SKRIVRIT, Sollentuna, Sweden
Filed Dec. 16, 1968, Ser. No. 783,909
Int. Cl. G09b 25/00
U.S. Cl. 248—324 3 Claims

A suspension arrangement for a teaching aid such as a roll map includes a series of elongate downwardly opening channels for slidably receiving a pair of support members which are spaced apart and interconnected by a rigid rod. The support members are adapted to detachably mount a support shaft or the like for the teaching aid. The teaching aid may be pivotably mounted for rotation with respect to the channels so that the angular position of the teaching aid may be varied.

3,604,673
PICTURE STRAIGHTENER
Robert I. Klein, 3 Beachwood Drive, Lawrence, N.Y.
Filed Nov. 14, 1969, Ser. No. 876,873
Int. Cl. A47f 7/14; A47q 1/17
U.S. Cl. 248—467 7 Claims

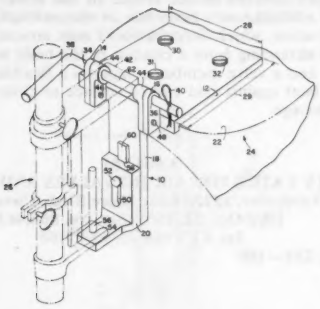


A two-part picture straightener, each part of which is attached respectively by a pressure-sensitive adhesive to the rear of a picture frame and the wall on which it is hung. Lateral displacement is prevented by a mating ridge and groove on respective elements. Also the two elements attract each other magnetically.

3,604,674
TROLLING MOTOR MOUNTING BRACKET
Donald L. Wilkerson, 739 Lily Flagg Drive, Huntsville, Ala.
Filed Apr. 3, 1970, Ser. No. 25,318
Int. Cl. B63h 21/26
U.S. Cl. 248—4 6 Claims

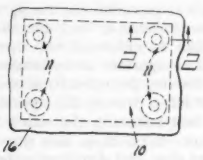
A trolling motor mounting bracket adapted to be permanently affixed to a boat and adapted to pivotally mount a

trolling motor outboard of the boat whereby the trolling motor may be raised to a horizontal stored position or



lowered to a vertical drive position. The bracket also permits the mounting of various-dimensioned trolling motors to the boat.

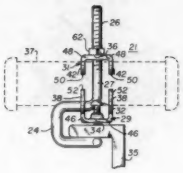
3,604,675
CONDENSER SUPPORT
Albert Mitchell, 725 E. 4th St., Royal Oaks, Mich., and White Leonard L., 27165 Bradford Lane, Southfield, Mich.
Filed June 5, 1970, Ser. No. 43,853
Int. Cl. F16f *15/00*
U.S. Cl. 248—22 **7 Claims**



An air conditioner condenser support member which is used in multiple units to form an insulated condenser base in lieu of a concrete base. The condenser support comprises an elongated rigid tubular member having an open lower end and a closed upper end. An outwardly extended flange is secured to the tubular member for engaging the ground and limiting the movement of the tubular member into the ground when the open end of the tubular member is inserted into the ground. The tubular member is provided with a resilient pad on the upper closed end thereof for insulation, noise reduction and vibration-dampening function. In use, at least four of the condenser supports are inserted into the ground, in a substantially rectangular disposition to form a mounting pad for an air conditioner condenser unit.

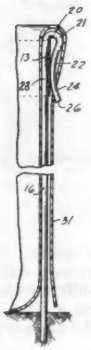
3,604,676
GROUNDING AND CLAMPING DEVICE
Walter H. Weber, Metuchen, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Oct. 21, 1969, Ser. No. 868,108
Int. Cl. F16l *3/10*
U.S. Cl. 248—68 **4 Claims**

A grounding and clamping device comprised of a combination conduit receiving and locking member and flange clamp to rigidly secure and ground a metallic electrical conduit to a supporting metallic structure. A pair of adjustably coupled recessed members provide a conduit receiving cavity therebetween within which the conduit may be secured; the recessed members may be tightened about the conduit placed within the cavity by threadably engaging threaded extensions protruding from one recessed member and through registering apertures in the other. Coupled to and extending from one of the recessed members is a flange clamp adapted to rigidly secure the recessed members to a support member. At each end of the flange-adapted recessed member is a locking means threadably coupled thereto and extending into



the clamp aperture to provide biting engagement between the recessed members and the support member.

3,604,677
BAG HOLDER
Edward C. Gits, LaGrange, Ill., assignor to John W. McConachie, Elmhurst, Ill., a part interest
Filed Oct. 22, 1969, Ser. No. 868,334
Int. Cl. B65b *67/00*
U.S. Cl. 248—97 **2 Claims**

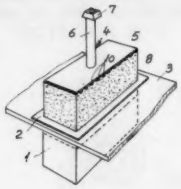


A three-piece holder for large bags consisting of a flexible linear strip whose ends are fastened together to form a wide-mouthed hoop and two leg members having sheperd's crook bent ends for enclampingly receiving the hoop. The other ends of the leg members are pointed and are designed to be stuck into the ground in an upright position to hold the hoop in a horizontal position above the ground. The bag is placed interiorly of the hoop with a portion thereof rolled over the top of the hoop and affixed to a complementary portion of the leg members whereby the bag will be held in an upright, open position.

3,604,678
APPARATUS FOR WITHDRAWING FROZEN ARTICLES OR BODIES FROM A FREEZING MOLD
Hans Gram, Vojens, Denmark, assignor to Brodrene Gram A/S, Vojens, Denmark
Filed Mar. 19, 1969, Ser. No. 808,415
Claims priority, application Denmark, Mar. 21, 1968, 1214/68
Int. Cl. B28b *7/10*
U.S. Cl. 249—66 **1 Claim**

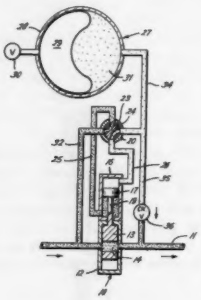
An apparatus for removing frozen articles of inhomogeneous materials from a mold, comprising a pickup member having a grooved lower surface which is frozen to the upper sur-

face of the article in such a way that an adherence between the frozen material and the grooved side of the pickup



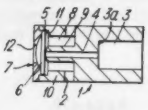
member of such a strength is obtained that this adherence can be used for lifting the article away from the mold.

3,604,679
VALVE OPERATOR
John V. Pennington, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.
Filed Nov. 6, 1969, Ser. No. 874,611
Int. Cl. F16k *31/14*
U.S. Cl. 251—26 **13 Claims**



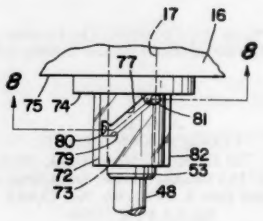
There is disclosed an operator for opening and closing a valve in response to pressure differentials. The energy for providing the pressure differentials is derived from pressure variations of fluid within a flowline, and such fluid is exhausted to the flowline during operation of the valve.

3,604,680
FLUID-PRESSURE-OPERATED SENSING DEVICE
Francis Xavier Kay, Winslow, England, assignor to Instruments and Movements Limited, London, England
Filed Aug. 22, 9169, Ser. No. 852,341
Int. Cl. F16k *7/17*
U.S. Cl. 251—61.1 **1 Claim**



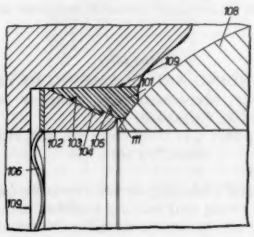
In one embodiment a fluid-operated sensing device comprises a body having a blind bore extending into the body and cylindrical spigot extending coaxially within the bore from the inner end of the bore. A coaxial exhaust passage extends from a conduit in the body coaxially, through the spigot to a valve seat formed at the and of the spigot and a valve member in the form of a disc is held captive in a counterbore at the outer end of the blind bore, between the valve seat and a cover member at the outer end of the blind bore having a central orifice. Vent openings are formed through the wall of the blind bore and the disc can be moved from a position in which it is out of engagement with said seal to allow compressed air to pass from the exhaust passage out of the vent openings, to a position in which it engages the valve seat, by an air jet directed at the orifice in the cover member In another embodiment a body has an external surface with single curvature, which forms a valve seat around an exhaust passage extending from a conduit in the body to the curved surface and a valve member comprises a flexible strip which can be bent against said curved surface to close off said exhaust passage.

3,604,681
SAFETY CATCH FOR AIR JIG VALVES AND THE LIKE
Joseph Verderber, 15255 Lake Shore Blvd., Cleveland, Ohio
Filed Oct. 22, 1969, Ser. No. 868,465
Int. Cl. F16k *35/00, 27/08*
U.S. Cl. 251—100 **8 Claims**



A safety catch is provided for air jig valves and the like, which is effective to latch or lock the air-control valve of an air jig or the like in either of two operative positions, to thereby prevent an operator or bystander from inadvertently or accidentally moving the valve from one of said positions to the other, or, at least, prevent the operator from moving the valve without first releasing the valve from its latched or locked condition. A cover is also provided for the safety catch to prevent dust and dirt from entering portions of the safety catch.

3,604,682
SEAT ASSEMBLY FOR ROTARY BALL VALVES
Cecil G. F. Richards, Queensland, Australia, assignor to B. C. Richards & Co., Pty. Ltd., Queensland, Australia
Filed May 13, 1970, Ser. No. 36,788
Int. Cl. F16k *11/04*
U.S. Cl. 251—362 **3 Claims**



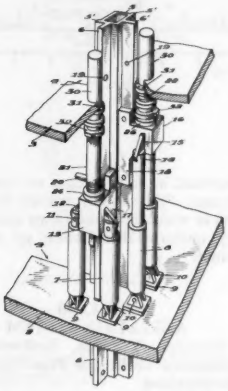
A seal assembly for a rotary ball valve having a sealing ring conically undercut on its rear face, and a backing ring mating with the undercut face as described in U.S. Pat. No. 3,387,815, includes a complementary interfitting circumferential ridge and recess on said mated surfaces.

3,604,683

JACKING MECHANISMS

John R. Sutton, P. O. Box 32, Beaumont, Tex.

Continuation-in-part of application Ser. No. 678,397, Oct. 26, 1967, now Patent No. 3,495,806, dated Feb. 17, 1970. This application July 10, 1969, Ser. No. 840,807
Int. Cl. E02d *21/00*
U.S. Cl. 254—106 16 Claims



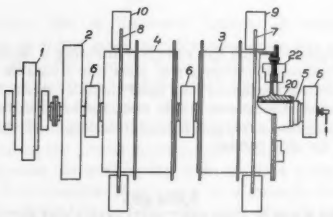
Jacking mechanism to be used in connection with supporting legs for raising or lowering a marine platform as employed, for example, in offshore barge-type equipment. The jacking mechanism combines the action of hydraulic cylinders with a power-driven threaded screw to effect climbing relative to a leg structure of a suitable support tower. Hydraulic cylinders are mounted at one end on a suitable support and at the opposite end connected with a head having means for detachable pin connection with a track along which the head can travel. The pair of hydraulic cylinders or jacks are located symmetrically of each leg section so as substantially to balance the load applied thereto. Movement of the head is opposed by the action of a threaded ram which acts primarily as a safety feature at all times.

3,604,684

MINE HOIST WITH RELOCKABLE WINDING DRUMS

Einar Eithun, and Josef Marchner, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed June 23, 1969, Ser. No. 835,691
Claims priority, application Sweden, June 27, 1968, 8712/68
Int. Cl. B66d *1/26, 1/44, 5/00*
U.S. Cl. 254—185 2 Claims



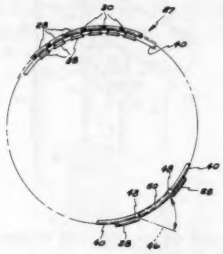
A mine hoist includes a shaft with two drums mounted thereon, one of which is turnable with respect to the shaft. An arrangement is provided for adjusting the relative angular positions of the shaft on the two drums. The movable drum is normally connected to the shaft by a friction clutch which is held in engagement by spring pressure and is released by the operation of a fluid pressure cylinder.

3,604,685

FENCE AND WALL STRUCTURES

Leonard A. Pokryfki, 8938 Hillcrest, Livonia, Mich.

Filed Nov. 29, 1968, Ser. No. 779,764
Int. Cl. E04h *17/18*
U.S. Cl. 256—25 19 Claims



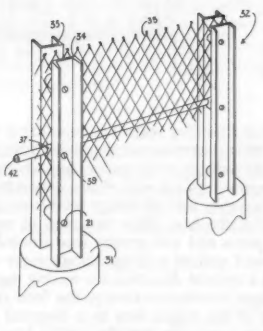
An assembly comprised of separate vertical panels locked to each other edge-to-edge to form a continuous wall or fence which is held in an upright substantially rigid expanded relation by means of inflated tubes secured to the panels.

3,604,686

FENCE

Rudolph E. Parisien, 891 Rainbow St., Ottawa, Ontario, Canada

Filed Apr. 15, 1969, Ser. No. 816,221
Int. Cl. E04h *17/14*
U.S. Cl. 256—32 2 Claims



A fence construction comprising bifurcated posts supporting fence material, each post being made up of two channel members having their lower ends secured to a base embedded in the ground. The fencing material is disposed between the channel members and fastening means are provided to secure the two channel members together.

3,604,687

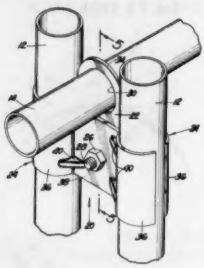
FENCE STRUCTURE

Rex T. Moore, 4722 Elmwood Court, Riverside, Calif.

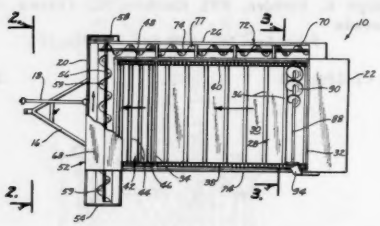
Filed Dec. 22, 1969, Ser. No. 887,466
Int. Cl. E04h *17/14*
U.S. Cl. 256—65 10 Claims

A corral fence made of galvanized steel pipe and comprising horizontal rails passing between and joined to pairs of laterally spaced, parallel posts by means of connecting brackets and associated plates. Each of the brackets includes a pair of opposed bracket members having cylindrically curved end portions which clamp against the sides of the posts, and flat center portions, between which the plate is clamped. The plate has an eye through which the rail passes, and is provided with a vertically elongated slot, through which a bolt passes. The plate is frictionally held between the

bracket members. The eye plate is struck a downward blow with a hammer, causing the plate to slide downwardly and indent the rail pipe on the top and bottom, so as to lock it against endwise movement.



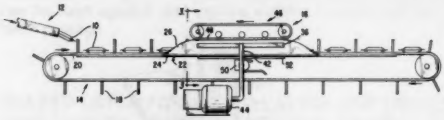
3,604,688
MIXING AND FEEDING WAGON
Dorland H. Schuler, Griswold, Iowa
Filed Jan. 12, 1970, Ser. No. 2,300
Int. Cl. B01f *7/08*
U.S. Cl. 259—6 **10 Claims**



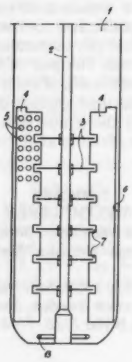
A mixing and feeding wagon comprising a wagon box having a drag chain means movably mounted therein which conveys feed forwardly to a reversible auger conveyor extending across the upper forward end of the wagon box. The reversible auger conveyor will discharge feed from one end thereof at one side of the box when operated in one direction for feeding purposes and will convey feed towards the other end to the forward end of a longitudinal auger conveyor when operated in a reverse direction for mixing purposes. The longitudinal auger conveyor conveys the feed rearwardly along the exterior of the wagon box to a diagonal auger conveyor which extends upwardly into the wagon box at the rearward end thereof. The diagonal auger conveyor has open flighting provided thereon which has decreasing diameter from its lower to upper ends. The reversible auger conveyor is operated in an opposite direction simultaneously with the drag chain means, longitudinal auger conveyor and diagonal auger conveyor to mix the feed in the wagon.

3,604,689
METHOD AND APPARATUS FOR FEEDING FLEXIBLE POUCHES
James L. Hutcheson, Richmond, and Nicholas Constantino, Henrico County, both of, Va., assignors to Reynolds Metals Company, Richmond, Va.
Filed Mar. 10, 1970, Ser. No. 18,207
Int. Cl. B01f *11/00*
U.S. Cl. 259—54 **24 Claims**

A method of and apparatus for feeding flexible pouches filled with a food product. In order to ensure that the food product is evenly distributed within the flexible pouch prior to subjecting it to a controlled temperature-time-pressure heating cycle, the pouches are fed to a processing station where they are vibrated within a vacuum pocket formed on the conveyor feed belt means. The vacuum pocket is formed by folding the marginal edge portions of the conveyor belt to form a substantially U-shaped trough. Partition means define the ends of the pockets along the conveyor and a cover means engages both the partition means and marginal edge portions of the conveyor belt to form an airtight pocket. An aperture is provided in each pocket to communicate with a source of vacuum. The vacuum causes the pouches to expand or puff up in which condition they are vibrated to effect a substantially uniform distribution of the food product within each pouch.



3,604,690
AGITATION SYSTEM
Knut Rude Traelnes, Yverdon, Switzerland, assignor to Societe d'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland
Filed Dec. 17, 1969, Ser. No. 885,685
Claims priority, application Great Britain, Dec. 24, 1968, 61354/68
Int. Cl. B01f *7/16*
U.S. Cl. 259—107 **7 Claims**

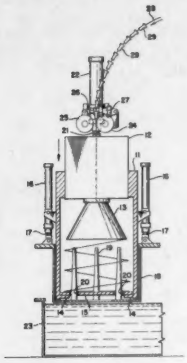


An agitation device for vessels containing a liquid, for example fermenters, comprises at least one rotatable disc having a serrated perimeter, an axial impeller concentric with the disc and at least one baffle cooperable with the serrated edge of the disc arranged to generate zones of shear in the liquid as the disc rotates.

3,604,691
APPARATUS AND METHOD FOR COILING AND QUENCHING ROD
William George Sherwood, Salem, Ohio, assignor to E. W. Bliss Company, Canton, Ohio
Filed May 29, 1969, Ser. No. 828,962
Int. Cl. C21d *9/52*
U.S. Cl. 266—3 R **7 Claims**

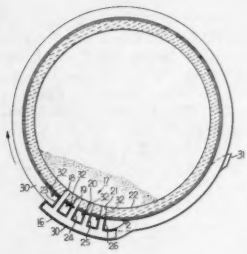
Hot rod is coiled and is progressively quenched in apparatus which comprises a coiling basket, laying surface, a reel head for depositing coiled hot rod on the laying surface

and a cooling tank with the reel head, laying surface, and coiling basket being movable to and from the coiling tank.



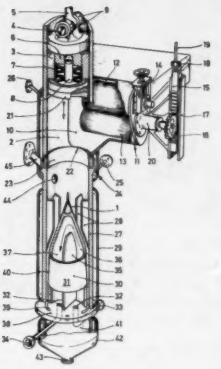
Also disclosed is a method for coiling hot rod and progressively quenching the coiled rod.

3,604,692
ROTARY KILN WITH END AND INTERMEDIATE DISCHARGE
Whitmell J. Smithwick, Brookfield, Wis., assignor to Allis Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Nov. 12, 1969, Ser. No. 875,626
Int. Cl. F27b *7/32*
U.S. Cl. 263—33 **5 Claims**



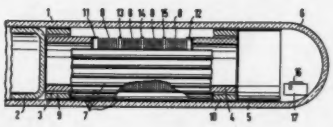
A rotary kiln is disclosed having, in material flow sequence, a drying zone, a preburning zone and a calcining zone. A provision is made for discharging a controlled portion of material from the kiln which has been dried but not calcined. Such a provision includes several radial passages projecting through the kiln shell in a common radial plane located along the kiln at approximately the end of the drying zone adjacent the preburning zone. A duct piece for each passage is connected on one end to a passage at the outer periphery of the kiln and the other end of each duct is connected to a conduit which encircles the outer periphery of the kiln shell for about one and one-quarter turns. An adjustable valve is provided in each duct to control the flow of material out of the kiln and into the encircling conduit. The encircling conduit terminates in a discharge opening which is a sufficient circumferential distance from the passages through the kiln shell, so that at least one portion of material is within the encircling conduit at all times and blocking the entry of atmospheric air into the kiln.

3,604,693
PROCESS AND APPARATUS FOR MELTING BULKY SCRAP MATERIAL FOR SYNTHETIC POLYMERS
Rudi Groepler, Schoenberg, Taunus, and August Jendrusch, Obererlenbach, both of, Germany, assignors to Vickers-Zimmer Aktiengesellschaft Planung und Bau Von Industrieanlagen, Frankfurt, Germany
Filed Apr. 9, 1969, Ser. No. 814,565
Claims priority, application Germany, Apr. 10, 1968, P 17 78 237.5
Int. Cl. F27b *17/00*
U.S. Cl. 263—40 **15 Claims**



In a process and apparatus for melting bulky synthetic polymer scrap material, the scrap material is introduced into a chamber by rollers and is compressed in the chamber by a piston. The compressed material is heated to melt it and the gases escaping from the material are withdrawn from the chamber in a direction opposite to the direction in which the molten material is withdrawn.

3,604,694
DEVICE FOR HEAT TREATMENT OF SILICON DISCS
Adolf Muller, Pretzfeld, Germany, assignor to Simens Aktiengesellschaft, Berlin and Munich, Germany
Filed Sept. 30, 1969, Ser. No. 862,242
Claims priority, application Germany, Oct. 4, 1968, P 18 01 187.5
Int. Cl. F27b *21/04*
U.S. Cl. 263—47 **3 Claims**

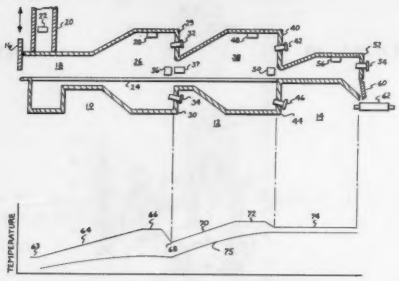


A device for heat treatment of silicon discs in an evacuable horizontal quartz tube. The silicon discs are arranged in stacks. A plurality of thin silicon rods arranged inside the quartz tube in mutually parallel relationship support the silicon discs.

3,604,695
METHOD AND APPARATUS FOR CONTROLLING A SLAB REHEAT FURNACE
Donald E. Steeper, Rexford, N.Y., assignor to General Electric Company
Filed Dec. 15, 1969, Ser. No. 884,887
Int. Cl. F27b *9/40*
U.S. Cl. 266—5 T **23 Claims**

In controlling a slab reheat furnace, the average temperature of each slab in a zone is predicted as a function of the

ambient temperature, thermal properties, dimensions, location, velocity and past thermal history of the slab. The deviations between the predicted average temperatures and predetermined desired average temperatures are weighted as



a function of location before being summed to establish a performance index. Proportional plus integral control techniques are used to determine what change in a zone temperature set point will drive the performance index to zero.

3,604,696

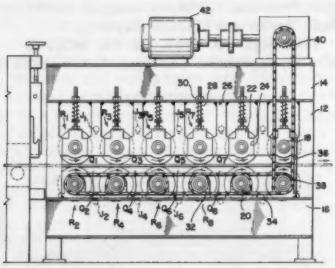
CONTINUOUS QUENCH APPARATUS

Vincent R. Coleman, Aurora, Ohio; Perry J. Murphy, Jr., Pittsburgh, and Victor N. Lockhart, Irwin, Pa., assignors to The Van Dorn Company, Cleveland, Ohio

Filed Dec. 10, 1968, Ser. No. 782,522

Int. Cl. C21d *1/62*

U.S. Cl. 266—6 S **3 Claims**



Apparatus for continuously and progressively quenching elongated flat steel members comprising a plurality of pairs of continuous cylindrical rolls, each roll pair being closely spaced from a successive roll pair and comprising an upper roll aligned and parallel with a lower roll, the nips of the roll pairs lying in the same plane. A plurality of upper and lower jet quench means are positioned between successive rolls, above and below said plane, the apparatus including means to support the rolls so that they apply a pressure on the steel member being quenched along continuous lines of contact across the member. Passageway means are provided in the rolls for a cooling fluid to cool the rolls, the rolls thereby providing an additional cooling action along said lines of contact of the rolls with the member so that the quenching is uninterrupted, uniform and complete.

3,604,697

HOOD AND LADLE ASSEMBLY FOR COLLECTING DUST POWDERS DURING POURING OF A MOLTEN MATERIAL

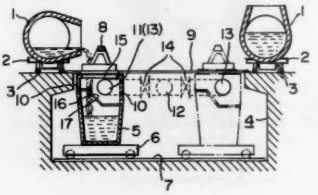
Masashi Kawana; Toshiro Sakai, and Takashi Kosukegawa, all of Kurashiki, Japan, assignors to Kawasaki Steel Corporation, Kobe City, Japan

Filed July 11, 1968, Ser. No. 744,084

Claims priority, application Japan, July 14, 1967, 42/45428

Int. Cl. C21c *5/40*

U.S. Cl. 266—31 **6 Claims**



A dust collecting apparatus for collecting duct powder produced during the pouring of molten pig iron comprises a ladle for receiving therein the molten pig iron an a hood assembly movable into alignment atop the ladle. The hood assembly has an opening through which the molten pig iron is poured and inclined guiding members are disposed on opposite sides of the opening to guide the flowing molten pig iron into the ladle. The hood assembly is also provided with a dust outlet which registers with an exhaust duct when the hood assembly is moved into position atop the ladle whereby dust powder produced during the pouring is vented through the exhaust duct and collected.

3,604,698

APPARATUS AND PROCESS FOR THE GASEOUS DEOXIDATION OF ANODE COPPER

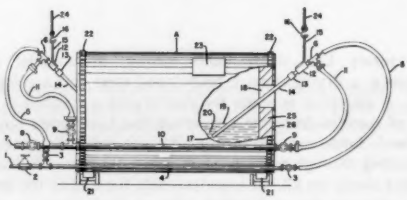
Nickolas J. Themelis, Beaconsfield, and Paul R. Schmidt, Hudson, both of Quebec, Canada, assignors to Noranda Mines Limited, Toronto, Ontario, Canada

Division of Ser. No. 627,779, Apr. 3, 1967, Pat. No. 3,545,962

Filed Oct. 8, 1969, Ser. No. 871,052

Int. Cl. C21c *7/00*

U.S. Cl. 266—34 T **2 Claims**



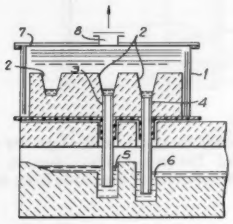
A process and apparatus for the gaseous deoxidation of molten metal in which a reformable hydrocarbon and steam is substantially simultaneously injected beneath the surface of molten metal in a furnace through water-cooled lances in which partial reforming of the hydrocarbon with the water vapor to carbon monoxide takes place in the lance prior to its introduction into and dispersion within the molten metal in the furnace.

3,604,699

VACUUM CHAMBER FOR DEGASSING MOLTEN METAL

Vadim Nikolaevich Rattenberg, ulitsa Sedova, korpus I, kv. 31, Moscow; Alexei Viktorovich Novikov, ulitsa Frunze, L3, kv. 16, Karagandinskoi Oblasti, and Lev Petrovich Fridman, ulitsa Leni na 35, kv. 6, Karagandinskoi Oblasti, all of, U.S.S.R.

Filed June 26, 2969, Ser. No. 836,853
Int. Cl. C21c *7/10*
U.S. Cl. 266—34 V 1 Claim



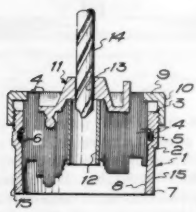
A vacuum chamber for degassing molten metal comprises a hermetical cylindrical container provided with a flat duct having the form of a volute-shaped spiral. Connected at the ends of the duct are two branch pipes for introduction and discharge of molten metal.

3,604,700

WORK-SUPPORTING DEVICES

Robert Gault, Sheffield, England, assignor to R. Gault Developments Limited

Filed June 9, 1969, Ser. No. 831,387
Int. Cl. B23q *3/02*
U.S. Cl. 269—288 17 Claims



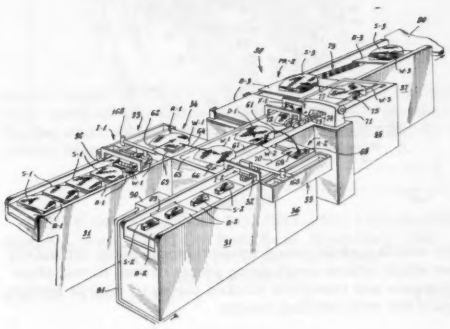
An engineering device which may serve as a work-holding device or as a work-machining tool comprises an enclosure open at one end at least packed with a multiplicity of rodlike elements, enabled to grip a workpiece pushed into the mass of elements, by a wedging action provided by a taper in the enclosure itself or by adjustable inner walls or by small balls within a space between a closed end of the enclosure and the inner ends of the elements and also extending round the sides of the mass of elements, two such devices being capable of incorporation in the jaws of a vice with the rodlike elements in the two jaws extending towards each other, or enabled to provide a multiplicity of teeth conforming to a profile or contour of a workpiece by pressing the protruding ends of the mass of elements against the workpiece with the elements inclined to the surface of the workpieces, the elements being held in such positions by small balls within a space between the inner ends of the elements and a closed end of the enclosure.

3,604,701

PROCESSES, SYSTEMS, AND COMPOSITE SYSTEMS FOR AUTOMATING THE MANUFACTURE OF WEARING APPAREL, HEADGEAR, FOOTWEAR, COMPONENTS THEREOF AND SIMILAR PRODUCTS

George F. Hawley, Bogota, N.J., assignor to Ivanhoe Research Corporation, c/o Robert A. Hack, New York, N.Y.

Filed Nov. 7, 1967, Ser. No. 681,267
Int. Cl. B65h *39/02*
U.S. Cl. 270—58 10 Claims



Processes, systems, and composite systems for automating the manufacture of wearing apparel, headgear, footwear, components thereof and similar products (herein called "garments, garment components, and the like articles") providing automatic handling of fabric workpieces to pass them through a multiplicity of work stations and to combine various sizes and shapes of workpieces to produce garments, garment components and the like articles, including steps of automatically feeding stacks of fabric workpieces into cooperative relationship with the respective systems of machine groups wherein the stacks of workpieces are carried by transportable interchangeable coordinating preregistration worktables which cooperatively fit with the respective systems in the composite to which these preregistration worktables are addressed, said transportable worktables serving as an integral part of the machinery to which they are addressed, interacting with the machinery to provide preregistration frames of reference and coordinate control passing the stacks from system to system, taking the workpieces one at a time from the preregistered stacks while differentiating the respective workpieces from the next ones in the stack, putting the workpieces into registry stations, registering them in the registry stations to bring them into more accurately known coordinate positions, combining them with other workpieces, transferring them into work stations and passing them through the work stations, performing work functions thereon and putting those workpieces which have had work functions performed thereon into subsequent stacks in appropriately preregistered positions upon other transportable interchangeable coordinating pregregistration worktables for automatically addressing these preregistered stacks in proper presentation to subsequent systems of the composite without requiring manual rearrangement of the individual workpieces to effect compatibility with the subsequent systems.

3,604,702

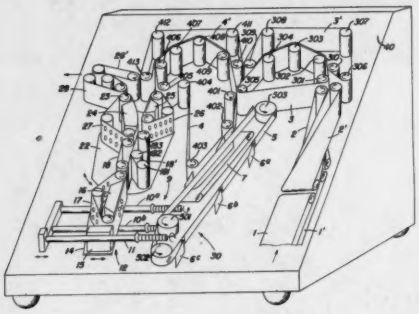
AUTOMATIC STACKER-FEEDER FOR A MAIL-HANDLING SYSTEM

Takeo Katagiri, and Kunio Hiromori, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed July 22, 1969, Ser. No. 843,733
Claims priority, application Japan, July 22, 1968, 43/51184
Int. Cl. B65h *3/12, 29/16*
U.S. Cl. 271—5 4 Claims

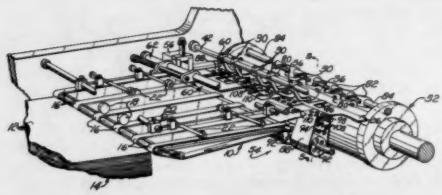
Apparatus adapted for use in mail-handling systems is disclosed in accordance with the teachings of the present invention wherein pieces of mail are supplied by conveyor belt means to alignment means which aligns said pieces of mail to

lie in a given plane, said aligned pieces of mail are delivered to rotating shaft means which stacks said aligned pieces of mail in successive order, said stacked pieces of mail are then individually removed from said rotating shaft means by



feeder means and delivered to overlapping piece separation means which returns overlapping pieces of mail to said alignment means and transports stacked pieces of mail to further stages of the mail-handling system.

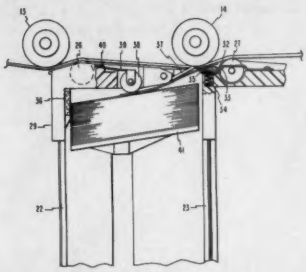
3,604,703
SHEET-FEEDING APPARATUS
Elmer D. Nash, Montgomery, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio
Filed June 20, 1969, Ser. No. 835,088
Int. Cl. B65h *9/06*
U.S. Cl. 271—48 **15 Claims**



The present sheet-feeding apparatus has a plurality of spaced-apart transfer belts through which vacuum is applied to the underside of a sheet to enable the transfer belts to move the sheet into a printing press or other machine. A plurality of fingers press the sheet toward the transfer belts to facilitate the application of vacuum to the sheet. In addition, high-velocity jets of air may be directed along the underside of the sheet, alone or in conjunction with the fingers, to form areas of low pressure to enable immediate firm gripping of sheets, thereby resulting in higher speed operation and production of the machine.

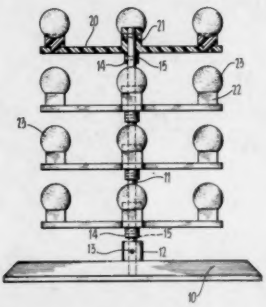
3,604,704
STACKER FOR DOCUMENT CARDS
Lonald L. Amundson, and James M. Rigotti, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 22, 1969, Ser. No. 859,655
Int. Cl. B65h *29/22*
U.S. Cl. 271—80 **7 Claims**

A stacker for document cards having a card-receiving pocket, a rotatable roller yieldably disposed at the top of the pocket by means of a cantilever spring, a pressure shoe disposed at the card entrance side of the pocket, and a resilient card stop at the other side of the pocket. A supporting plate for the cards is disposed in the pocket and is yieldably held from downward movement in the pocket so as to support a stack of cards therein. As the cards enter the pocket, they deflect the cantilever spring while making contact with the roller and cause the roller to rotate so that the



roller drives the cards forwardly and snaps the cards off the pressure shoe; and the roller also, due to its rotation, prevents substantial rebound of the cards from the card stop.

3,604,705
GAME COUNTER HOLDER
Nathaniel F. Hawthorne, 855 Cedar St., Alameda, Calif.
Filed Mar. 10, 1969, Ser. No. 805,603
Int. Cl. A63f *9/00*
U.S. Cl. 273—148 R **4 Claims**

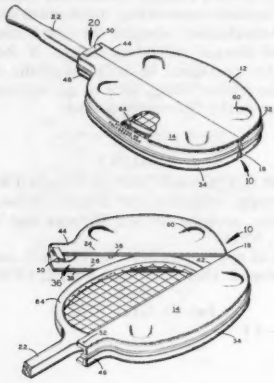


In the device of the present invention, each player tries to secure as large a count as possible, after the first player has secured the requisite number of cards, by securing as many counters as possible. Preferably, the counters are of the nature of ping-pong balls, as such balls are light, resilient, and very active in their bouncing. In the preferred form of the game, the balls can be secured only by means of a pair of tongs which each player has. Preferably, the balls are set in the middle of a table on a device such as shown in the drawings which comprises a plurality of rotatably mounted X-bars carried by a perpendicular shaft. In the present game, when a player has secured the requisite number of cards, he picks up his tongs and starts grabbing the ping-pong balls as fast as he can. The other players, upon perceiving his action, do the same.

3,604,706
RACKET PRESS AND COVER
Lucille F. Baukney, 5203 N. 24th Terr., Fort Lauderdale, Fla.
Filed Jan. 10, 1969, Ser. No. 790,207
Int. Cl. A63b *49/14, 49/16*
U.S. Cl. 273—74 **2 Claims**

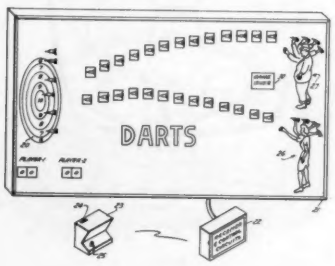
A racket press and cover including two shell halves pivotally connected together to be opened and closed so that the head of a tennis racket may be inserted therein and

removed therefrom. The shell halves and the pivot connection are, in the illustrated embodiment, molded from plastic.



The shell halves have indentations therein which yield resiliently when engaged with the frame of the racket to maintain the frame against warping.

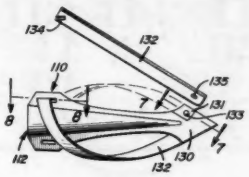
3,604,707
ELECTRIC DART GAME AND THE LIKE
Frederick A. Hurley, Miami, Fla., assignor to Funtronics, Inc., Miami, Fla.
Filed Mar. 24, 1969, Ser. No. 809,534
Int. Cl. A63f *9/00*
U.S. Cl. 273—85 R **5 Claims**



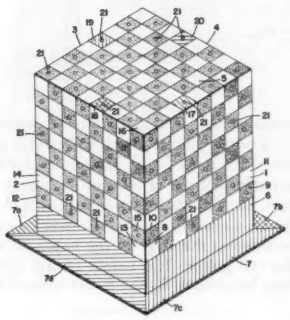
An electronic amusement game is provided having a wall-mounted display panel. Such wall-mounted display panel may be selectively illuminated to provide animation for the amusement game. Remote control means including a coin transmitter and a play transmitter are radio coupled to receiver and control circuit means. The remote control means are actuated by insertion of coins and by actuation of the play transmitter. Actuation of the play transmitter two consecutive times energizes the receiver and control circuit means to show on the display panel the position of a simulated object in a target area. The length of time between the two actuations determines the exact final location of the simulated object. Such receiver and control circuit means also provide a score indication and terminate the game after a certain score has been attained.

3,604,708
SERPENTINE ARROWHEAD
Louis J. Brozina, 303 Alcove Rd., Grand Junction, Colo.
Filed Sept. 12, 1967, Ser. No. 667,102
Int. Cl. F41b *5/02*
U.S. Cl. 273—106.5 B **2 Claims**

An arrowhead having two cutting edge portions extending rearwardly from their point of attachment to a frontal blade portion, and spiraling about the axis of an arrowhead ferrule. Each cutting edge portion encompasses 180° of the ferrule so that acting together they cut a plug from the flesh of an animal target. At their rear points of attachment the cutting edge portions are fastened by a mechanical interlock to flanges which extend radially outwardly from the ferrule. The cutting edge portions may be made replaceable.



3,604,709
THREE-DIMENSIONAL BOARD GAME APPARATUS
Joseph J. Svetz, 12492 Old State Road, Huntsburg, Ohio
Filed May 14, 1970, Ser. No. 37,260
Int. Cl. A63f *3/02*
U.S. Cl. 273—134 AD **9 Claims**

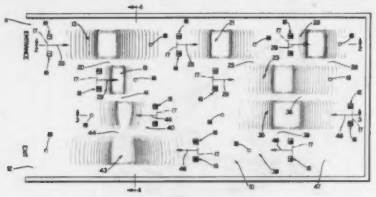


A three-dimensional game is provided, of generally cubical form, the sides and top of which are provided with squares arranged in somewhat checkerboard fashion, and having holes or recesses for reception of pegs. Moves are made towards a target with the pegs, in a manner dictated by the roll of dice, or by spinning an index or pointer on a dial bearing numbers. The targets are in the form of squares of preselected colors corresponding to the colors of the pegs of each player. Interest is created by adherence to special rules or instructions incidental to the playing of the game. The game may be played by two or four players.

3,604,710
INDOOR GOLF PUTTING GAME
John Jacobs, 4884 S. Boulevard N.W., Canton, Ohio
Filed Aug. 15, 1969, Ser. No. 850,373
Int. Cl. A63b *67/02*
U.S. Cl. 273—176 E **1 Claim**

An indoor golf putting game having a series of elongated relatively narrow putting greens, each with a cup at one end, laid out upon a horizontal surface. The putting greens have variously curved contours built upon the lower horizontal surface. The spaces between the putting greens are level. The entire area, including the spaces between the putting greens, is covered with a carpet to simulate the grass upon an outdoor golf putting green. Markers are placed at the entrance end of each putting green, with information thereon as to the number of the hole, and the number of strokes that is par for

the hole. A removable panel, bearing indicia indicating the length of the putting green, is secured to each marker by a



dovetail joint. The game is played with conventional golf balls and putters such as are used for outdoor golf.

3,604,711

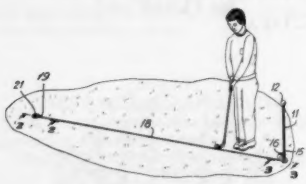
GOLF-PUTTING GUIDE

George B. Hansburg, Hansbury Acres, Walker Valley, N.Y.

Filed Feb. 27, 1969, Ser. No. 802,767

Int. Cl. A63b *69/36*

U.S. Cl. 273—183 R **2 Claims**



This invention relates to a golf-training device and more particularly to a putting guide which will enable the golfer to practice putting. The device comprises an upright post which may be detachably secured in the putting green at the position of the ball, the post rigidly mounting a reel at its lower end which carries a cord or tape which may be extended and detachably secured at the edge of the hole, the tape serving as a guide for the golfer. The height of the upright post is such that it may be grasped by the golfer without bending.

3,604,712

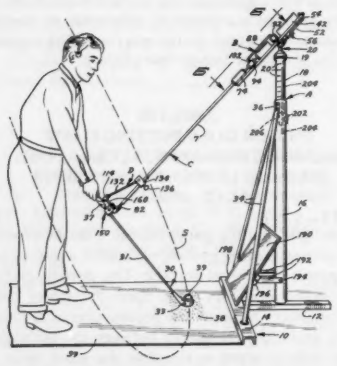
GOLF CLUB PRACTICE SWING GUIDE

Arthur Prior, Lansing; Frank Albro, Lansing, Mich., and Frank W. Hetman, Minneapolis, Minn., assignors to DeVac, Inc., Minneapolis, Minn.

Filed May 7, 1969, Ser. No. 822,551

Int. Cl. A63b *69/36*

U.S. Cl. 273—186 R **11 Claims**



A golf practice club guide having a standard supporting rotary and translatory motion producing mechanism at the upper end thereof, motion-transmitting mechanism attached to and actuated by the motion-producing mechanism and depending therefrom, clamp means attachable to the shaft of a club and club motion control mechanism carried and actuated by said motion-transmitting mechanism and connected to said clamp mechanism whereby the club is caused to swing with the head thereof moved in an arc. If the club is not swung perfectly, resistance in the parts of the device is met while, with the proper swing, little or no resistance is met in the mechanism as the club swing is made.

3,604,713

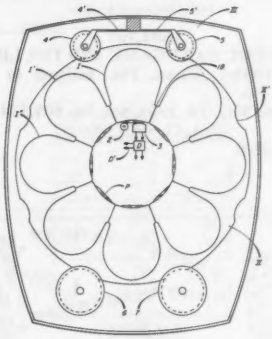
MAGNETIC TAPE CARTRIDGE CHANGER SYSTEM

Dean C. Karnopp, Arlington, and John C. Heine, Cambridge, both of, Mass., assignors to Bolt Beranek and Newman Inc., Cambridge, Mass.

Continuation of application Ser. No. 700,967, Jan. 26, 1968, now abandoned. This application Feb. 2, 1970, Ser. No. 7,382

Int. Cl. G11b *17/00*

U.S. Cl. 274—4 F **6 Claims**



Magnetic tape cartridge changer system wherein cartridges within a magazine may be selected at the discretion of the user or may be played in sequence automatically. Single reel cartridges are snapped into a circular magazine and have exposed portions which follow a circular path to reach a playing position at which a drive roller and transducing head are located. High frequency control signals on the tapes control a motor and gear drive for indexing the cartridges, and the magazine may be turned manually.

3,604,714

BIDIRECTIONAL TAPE TRANSPORT FOR CASSETTES

Theophiel Clement Jozef Lodewijk Staar, Kraainem, Belgium, assignor to Staar S.A., Brussels, Belgium

Filed June 20, 1968, Ser. No. 738,619

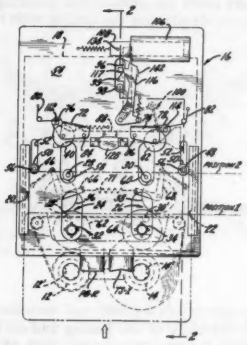
Claims priority, application Belgium, June 28, 1967, 45520

Int. Cl. G11b *15/30, 23/10;* **B65h** *17/12*

U.S. Cl. 274—4 E **15 Claims**

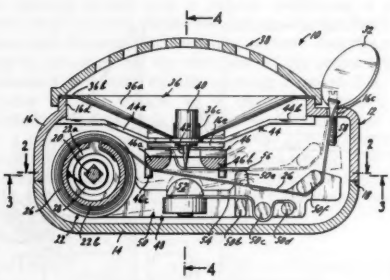
A bidirectional tape transport for cassettes, which affords at the selection of the user (1) drive of the tape in either direction, (2) drive of the tape first in one direction of the completion of the playing operation and then in the other direction to the completion of the second playing operation,

(3) cassette ejection automatically as the end of the tape is reached after the completion of one or after completion of



both playing operations, and (4) ejection of the cassette at any stage of said operations.

3,604,715
SOUND-REPRODUCING DEVICE
Gerhart Weiss, Flushing; Henry Nemeth, Massapequa, and Burt W. Ensmann, Flushing, all of, N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.
Filed Nov. 6, 1969, Ser. No. 874,609
Int. Cl. G11b *25/06*
U.S. Cl. 274—11 R **10 Claims**

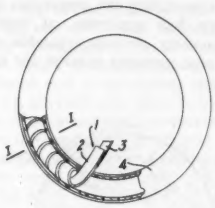


A manually operable sound-reproducing device which uses a linear recording tape having plural side-by-side sound grooves which extend longitudinally of the tape and may be played back on a random basis by pulling the tape past the sound-reproducing system of the device. Depending upon the direction of the initial pull on the tape, one of a plurality of messages recorded on the corresponding sound groove of the tape may be reproduced by the device.

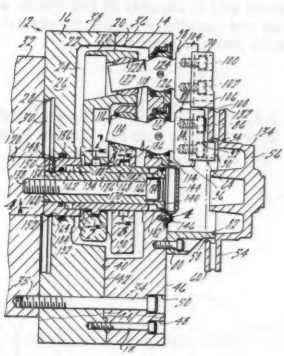
3,604,716
SELF-TIGHTENING SEAL
Jacques Webert, 46 Rue Victor Basche, 92-Montrouge, France
Filed Dec. 2, 1969, Ser. No. 881,431
Claims priority, application France, Dec. 3, 1968, 176,370
Int. Cl. F16j *9/00;* **F02f** *5/00*
U.S. Cl. 277—26 **4 Claims**

The seal produces a self-tightening action as a function of temperature particularly when the temperature is low.

It comprises external deformable packing element and a core formed by two metals with different expansion coefficient, these metals being disposed in such a way that the metal with higher expansion coefficient is near the packing element and that, when the temperature decreases, the differential expansion of the two metals produces an expansion of the core toward this packing.



3,604,717
PINCH CHUCK
George Hohwart, Howell, Mich., assignor to N. A. Woodworth Company, Ferndale, Mich.
Filed Dec. 15, 1969, Ser. No. 884,959
Int. Cl. B23b *31/10*
U.S. Cl. 279—1 DA **16 Claims**

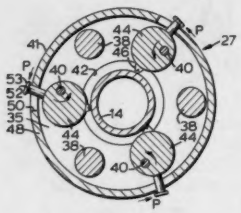


A chuck provided with two sets of opposed work holding jaws having axially oppositely angularly inclined rocker arm portions pivotable in swivel mountings to clamp and release the jaws, and means for pivotally actuating the arm portions of the jaws including a reciprocable actuator, two sets of longitudinally shiftable actuator bars—one for each set of jaws—carried by the actuator, and circumferentially adjustable wedge members also carried by the actuator at the ends of the bars, each actuator bar being associated with a respective work holding jaw and operatively connected to the rocker arm portion thereof so that movement of the actuator in one direction pivots the two sets of rocker arms in opposite directions to move the two sets of jaws in opposition to each other to engage the workpiece with a pinch action, the connecting means and particularly the actuator bars and the wedge members operating, shifting and adjusting automatically under clamping pressure to centralize the surface of the workpiece engaged by one set of jaws in the chuck, to compensate for eccentricity or out-of-roundness of the surface engaged by the other set of jaws, and to equalize or otherwise selectively distribute clamping pressure among the jaws.

3,604,718
TONG ASSEMBLY FOR DRILL PIPES
Floyd W. Becker, Calgary, Alberta, Canada, assignor to Becker Drilling, (Alberta) Ltd., Calgary, Alberta, Canada
Filed June 9, 1969, Ser. No. 831,694
Int. Cl. B23b *31/12*
U.S. Cl. 279—1 SG **3 Claims**

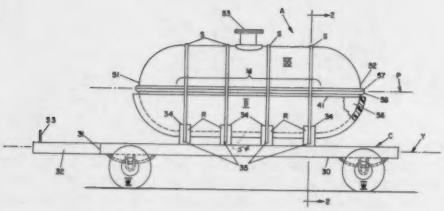
A tong apparatus for use with a rotary drill apparatus whereby threadedly engaged sections of drill pipe may be

disconnected. The apparatus comprises: a mounting element for positioning around a section of drill pipe and spaced therefrom, a coaxial extension above said mounting element having means for connecting the apparatus to the power swivel of the rotary drill apparatus, at least one pivotal member on the mounting element rotatable about a pivot axis and having a pipe gripping portion for contacting the



section of drill pipe when the pivot member rotates in one direction with respect to the mounting element and which moves away from the section of drill pipe when the pivotal member rotates in the other direction with respect to the mounting element. An inertial element is integral with the mounting element and is capable of movement with respect to the pivot axis and capable of urging the pivotal member to move tangentially about the pivot axis.

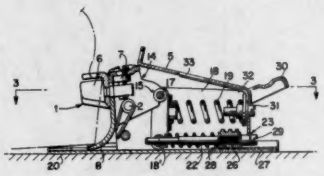
3,604,719
TOWABLE LIQUIDS STORAGE TANK ASSEMBLY
Raymond W. Kerr, 3731 N. 58th St., Lincoln, Nebr.
Filed Jan. 26, 1970, Ser. No. 5,547
Int. Cl. B60p *3/22*
U.S. Cl. 280—5 **5 Claims**



This invention provides a towable liquids storage tank assembly which is especially adaptable for the transporting of agricultural liquid chemicals including fertilizers and pesticides. Primary portions of the towable tank assembly include an elongate thin-walled resinous storage tank, an underlying separable tublike saddle therefor, and a rollably towable trailerlike support means for the saddled tank. The tublike saddle is preferably of a resinous construction molded by the novel method herein i.e. against the lower external surface areas of the elongate resinous storage tank.

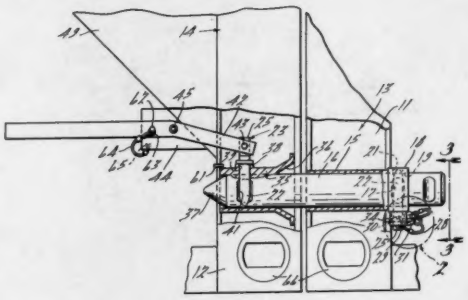
3,604,720
SAFETY ATTACHMENT FOR SKIS
Henri Reuge, Les Replans, and Roger Paillard, Sainte-Croix, Vaud, both of, Switzerland, assignors to Reuge S. A., Sainte-Croix, Switzerland
Filed Mar. 28, 1969, Ser. No. 811,444
Claims priority, application Switzerland, Mar. 29, 1968, 4709/68
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **3 Claims**

A safety attachment for a ski for the heel of a shoe having a fixed baseplate and a pivoting element mounted on the plate for the heel attachment. The element is a metallic plate bent in the form of a U whose branches are directed towards the rear with each of them having two spaced notches aligned in pairs. A pivoting control lever has a transverse axis provided with rollers and a compression spring applies said rollers elastically into one of said pairs of notches according to the position of the pivoting element. A casing encloses the pivoting element and the control lever with two lateral sides between which are fixed the axes of the pivoting element and the lever. Means for displacing the casing with relation to the



fixed base plate comprises a guide rod mounted on one hand in an opening at the back of the casing and on the other hand in a boring provided in the transverse axis. An endless screw wheel is mounted upon a channelled portion of the rod cooperating with a rack integral with the baseplate. A compression spring is located between the transverse axis and the wheel for urging the casing forwardly toward the heel of the shoe.

3,604,721
TWO-POSITION FRAME COUPLER
Adrian F. Hulverson, Grosse Point Woods, Mich., assignor to Fruehauf Corporation, Detroit, Mich.
Filed June 11, 1969, Ser. No. 832,391
Int. Cl. B62d *21/12*
U.S. Cl. 280—34 A **6 Claims**

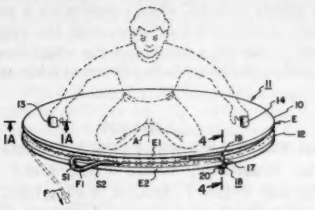


The coupler joins two chassis frames to form an elongated unit which can be transported by a tractor. The rear end of the frame has a pin in each corner which may be adjusted to extend different amounts therefrom. The front end of the frame has two apertures to receive the pins which are locked therein to couple the one end of one frame to the other end of a second frame.

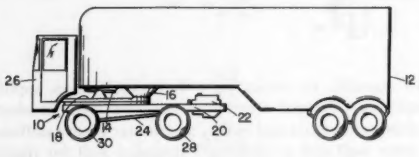
3,604,722
WHEELED REVOLVABLE RIDER PLAY PLATFORM
Kay B. Boley, 985 West 320 North, Orem, Utah
Filed Mar. 2, 1970, Ser. No. 15,498
Int. Cl. B62b *11/00*
U.S. Cl. 280—87.01 **6 Claims**

The present invention comprises a toy device in which a platform is provided with manually gripping means and also with a peripheral edge groove accommodating rope or cable placement. In a preferred form, the invention includes edge slots or equivalent means by which the direction of winding of the rope or cable may be reversed, this at a point midway

of the rope's length when inplaced. Rapid pulling of the rope will rapidly revolve a person sitting or kneeling on the platform and may offer both clockwise and counterclockwise rotations by a single rope pull. The device may also be used as a dolly, if desired.

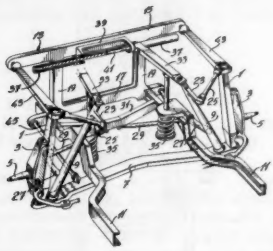


3,604,723
STEERING SYSTEM FOR WHEELED VEHICLES
Harold C. Daily, 618 Vista Lane, Laguna Beach, Calif.
Filed Aug. 1, 1969, Ser. No. 846,823
Int. Cl. B62d *7/00*
U.S. Cl. 280—91 **2 Claims**



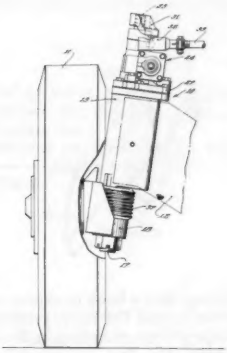
A steering system and a vehicle employing a steering system incorporating means for introducing feedback in the connection between the steering element and the steering wheel to the end that the direction of the steered wheel is determined not only by the steering element but by the response of the vehicle to a change in steered wheel direction. This feature is combined in an articulated vehicle with a pivotal connection between the two portions of the vehicle at a point ahead of the steered wheel. The steered wheel is carried by one portion of the articulated vehicle and in which the driver's station is carried by the other section of the vehicle.

3,604,724
AUTOMOBILE-SUSPENSION
Paul Corbin, 7737, rue St. Denis, Montreal, Quebec, Canada
Filed June 30, 1969, Ser. No. 837,760
Int. Cl. B60g *11/64*
U.S. Cl. 280—96.2 **7 Claims**



An automobile suspension having a body, a pair of uprights each on one side of the body with a wheel mounted thereon and supporting struts to which the front end of the body is suspended, the struts being inclined toward one another for the suspension of the body above the center of gravity thereof. The body has a frame that includes a radiator support yoke at the front end with a torsion rod assembly mounted at the top of the yoke. A pair of trailing arms are articulated at the rear end to the top of the supporting struts and operatively connected at the forward end to the top of the yoke. Two shock absorber units are connected respectively to the frame and to the trailing arms adjacent the supporting struts or, alternatively, directly to the top of the supporting struts. First articulated connections on one side of each strut join the top of the struts and the top of the corresponding uprights while second articulated connections on the sides of the struts opposite that of the first connections interconnect the lower end of the struts and the body at the bottom thereof.

3,604,725
HYDRAULIC SUSPENSION AND STEERING SYSTEM FOR VEHICLES
Raymon L. Goff, and Frederick Eugene Dion, both of Lafayette, Ind., assignors to TRW Inc., Lafayette, Ind.
Filed Aug. 20, 1969, Ser. No. 851,542
Int. Cl. B60s *9/00*
U.S. Cl. 280—96.2 **22 Claims**



A self-contained oleopneumatic strut suspension system for wheeled vehicles accommodating steering of the wheels and including a pneumatic spring-opposing movement of a fluid-supported piston. In the preferred embodiment the gas spring has a bladder disposed in a porous member such as a perforated tube to minimize damage thereto. The system also includes an additional fluid supply source to compensate for the loading of the vehicle and a bypass around the piston to enable limited movement of the piston before adding additional fluid or acting against the gas spring device. In the preferred embodiment, the system includes a steering mechanism mounted on the upper end of the cylinder to rotate the piston to turn the wheel mounted thereon in response to a steering input or force.

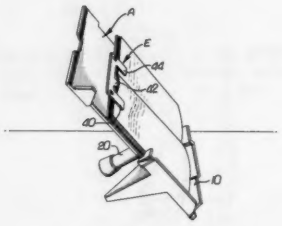
3,604,726
BALANCE BALL FOR AMUSEMENT AND EXERCISE
Charles W. Tracy, Tallahassee, Fla., assignor to International Enterprises, Inc., Tallahassee, Fla.
Filed June 25, 1969, Ser. No. 836,364
Int. Cl. B62k *1/00*
U.S. Cl. 280—205 **4 Claims**

Apparatus including a platform on a freely rotatable ball utilized for developed muscular coordination and balance as well as for amusement. A dome-shaped housing extends over the ball. Secured to the housing is a circular plate on which the user stands. Between the housing and the ball are an-

tifriction devices. In one form, these are ball bearings. In another form, these are low friction areas of Teflon. To

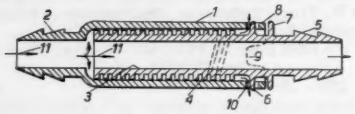
retain the housing on the ball, a skirt is secured to the housing and extends below the diameter of the ball.

3,604,727
COPYHOLDER AND ASSEMBLER
Douglas G. Wilkin, 3061 Evelyn St., La Crescenta, Calif.
Division of Ser. No. 647,969, June 22, 1967, Pat. No. 3,484,072
Int. Cl. B42d *9/00*
U.S. Cl. 281—42 **3 Claims**



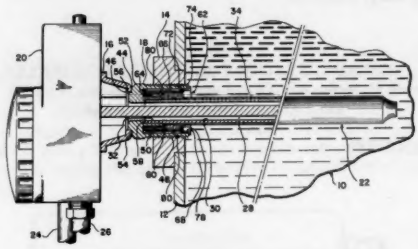
A device for holding open a book to expose selected pages. The device comprises a rigid flat body, preferably of plastic, having three coplanar prongs extending in the same direction from a common base. The first and second prongs extend from ends of the base, while the intermediate, longer third prong is situated relatively closer to the second prong to form therebetween a narrow slot. To hold open a book, the third prong is inserted beneath several leaves on one side of the spine, the second prong is placed atop the same leaves, and the first prong is positioned over the leaves on the other side of the spine. The resultant arching of the leaves retains the device in place and holds open the book.

3,604,728
DRIP LEVEL IRRIGATION
Blass Symcha, and Ishajahu Blass, both of 26 Manch St., Tel Aviv, Israel
Filed Sept. 25, 1969, Ser. No. 861,123
Claims priority, application Australia, Jan. 3, 1969, 48630/69
Int. Cl. F16l *55/00*
U.S. Cl. 285—14 **4 Claims**



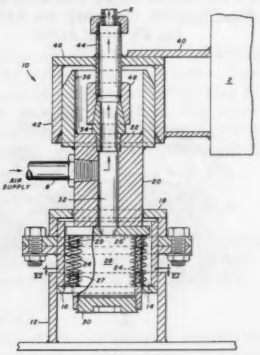
An irrigation dripper unit for use in irrigation in association with an irrigation supply pipe and also, when combined with a supply pipe, to form together with the supply pipe an integral unit. The dripper unit can be connected in series with the supply pipe or, when constituting a part of the integral unit, is connected in series with the supply pipe and has means to tap off a portion of the water flowing through the unit and to discharge such portion at a low drip rate.

3,604,729
MOUNTING ASSEMBLY FOR A THERMOSTAT
Henry C. Braucksiek, Buena Park; Lloyd R. Warner, Downey, and Wilbur F. Jackson, Rolling Hills, all of, Calif., assignors to Robertshaw Controls Company, Richmond, Va.
Filed Jan. 30, 1969, Ser. No. 795,214
Int. Cl. F16l *11/12*
U.S. Cl. 285—47 **9 Claims**



An assembly for mounting a thermostat on an appliance comprising a flanged member, a coupling member abutting the flanged member and having an annular groove defined by an outer wall and an internally threaded wall for receiving the threaded open end of a copper tube of a thermally responsive device, and an insulator inserted in the groove and shaped so as to form an airspace or pocket with the inner surface of the outer wall of the coupling member whereby galvanic corrosion is prevented and compressive installation forces are insulated from the copper tube.

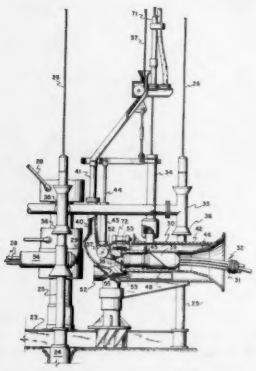
3,604,730
MAKE-AND-BREAK CONNECTION
Charles J. Carroll, McKeesport, and Stephen Shufran, North Versailles, both of, Pa., assignors to United States Steel Corporation
Filed May 29, 1969, Ser. No. 828,932
Int. Cl. F16l *35/00*
U.S. Cl. 285—27 **1 Claim**



The apparatus described is a make-and-break joint connection for a conduit of a pressure-fluid-supply line. The ap-

paratus includes a relatively fixed tubular socket having a tubular plunger reciprocable therein and protruding from one end thereof. A flexible fluid-supply conduit is connected with the plunger and communicates with a fluid passageway extending longitudinally through the plunger. Spring means are disposed within the socket to provide a floating mounting for the plunger so that it is capable of being tilted angularly and moved horizontally relative to the socket. The apparatus further includes a cup movable toward and from the protruding end of the plunger for telescoping engagement therewith. A fluid tube is provided through the bottom of the cup for connection with a fluid conduit leading to an operating pressure cylinder A coupling on the protruding end of the plunger is adapted to engage a coupling on the inner end of the fluid tube in the cup to create an unobstructed fluid passageway between the two conduits when the cup is telescoped onto the protruding end of the plunger. The apparatus is particularly suitable where it is desired to utilize a make-and-break connection which is self-aligning and speedy in operation.

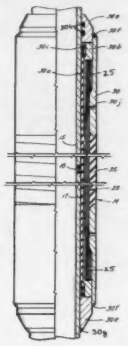
3,604,731
SIMULTANEOUS PIPELINE-WELLHEAD CONNECTIONS
William H. Petersen, Metairie, La., assignor to Shell Oil Company, New York, N.Y.
Filed May 19, 1969, Ser. No. 825,781
Int. Cl. F16l *39/04*
U.S. Cl. 285—29 **9 Claims**



A method and apparatus for connecting a plurality of pipelines or the like to an underwater installation in which a "bundle" of coextensive pipelines is pulled by suitable means toward the installation where rotational alignment means carried by the installation and by the end of the pipeline bundle cooperate to rotate the bundle into a predetermined position. The pipelines may then be connected in fluidtight relationship with corresponding flowlines carried by the underwater installation.

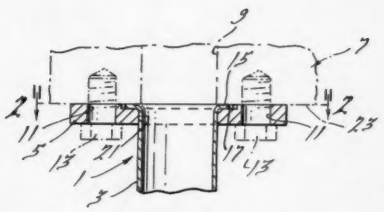
3,604,732
INFLATABLE ELEMENT
Billy C. Malone, Houston, Tex., assignor to Lynes, Inc.
Filed May 12, 1969, Ser. No. 823,880
Int. Cl. F16l *33/16*
U.S. Cl. 285—106 **42 Claims**

An inflatable member having an inflatable element which in some instances surrounds a body. The inflatable element is surrounded by a reinforcing sheath comprising longitudinally extending, circumferentially overlapping strips the ends of which are received in sleeves. A member is positioned adjacent the end of the strips and between the strips within the sleeves. The strips at each end including the members therebetween are secured together with an adhesive within the sleeves. Either or both ends of the inflatable element may be movable, and the movable end is provided with a void-forming medium or material to prevent the adhesive from filling a portion of the space adjacent the movable end and



thereby provides a space to accommodate longitudinal movement of the end of the element by compressing or collapsing the material.

3,604,733
MECHANICAL SEAL FLANGE CONSTRUCTION
Franklin R. Hubbell, III, Brooklyn, Mich., assignor to Tenneco Inc., Houston, Tex.
Filed May 14, 1969, Ser. No. 824,406
Int. Cl. F16l *25/00*
U.S. Cl. 285—334.5 **3 Claims**

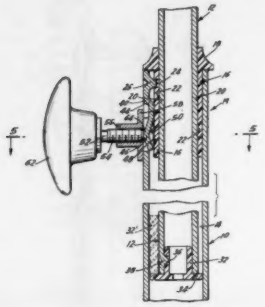


An attachment mechanism useful for securing an exhaust pipe to an exhaust manifold comprises an attachment pad which is loosely mounted on the exhaust pipe to engage a canted flange and resiliently press the flange against the manifold when the bolts are screwed home thereby tensioning the bolts and mechanically sealing the tube.

3,604,734
ADJUSTING AND LOCKING MECHANISM FOR ADJUSTABLE AND COLLAPSIBLE TABLE
Walter Friedman, New York, and Aaron Kaufman, Rosedale, both of, N.Y., assignors to Re-Ly-On Metal Products Inc., Brooklyn, N.Y.
Filed May 13, 1969, Ser. No. 824,108
Int. Cl. E04g *25/02*
U.S. Cl. 287—58 **9 Claims**

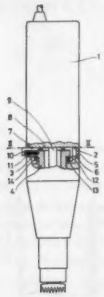
Mechanism for adjustably connecting and locking in adjusted positions two telescoping tubular members which serve as a single standard for interconnecting a table base and a vertically adjustable weight-biased table top, in which the telescoping tubular members are connected for their relative adjustment to produce therebetween a frictionally smooth sliding movement restricted to a maintained straight

vertical direction, and in which the locking mechanism is structured to require but a small manual effort on the part of



the user, yet be able to apply or exert a large force on the tubular members such as to firmly lock the same together.

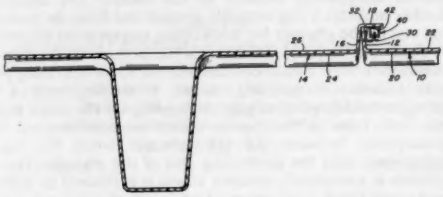
3,604,735
COUPLING FOR DENTAL INSTRUMENTS
Erich Hoffmeister, Biberach an der Riss, Germany, assignor to Kaltenbach & Voigt, Biberach an der Riss, Germany
Filed Aug. 25, 1969, Ser. No. 852,844
Claims priority, application Germany, Aug. 28, 1968, P 17 91 013.3
Int. Cl. F16b *7/00*
U.S. Cl. 287—119 R **3 Claims**



The invention relates to a coupling for the connection of a dental straight or angle handpiece to an electrical driving motor constructed as a miniature motor, the coupling being arranged substantially within a disc which is connected to the drive-side end of the miniature motor. The coupling is constituted by operating element movably mounted in the disc and which is urged into locking position by a spring.

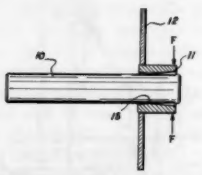
3,604,736
PANEL JOINT CONSTRUCTION
Lawrence T. Vance, Pittsburgh, Pa., assignor to Engineered Products, Inc., Pittsburgh, Pa.
Filed Apr. 17, 1970, Ser. No. 29,616
Int. Cl. F16b *5/00*
U.S. Cl. 287—189.36 **10 Claims**

A panel joint construction having a first panel with a first rearwardly directed flange portion and a second panel having a second rearwardly directed flange portion terminating in an end sector disposed rearwardly of the first panel. A panel clip receiver element secured to one panel and a panel clip secured to the other with the panel clip engaged within the panel clip receiver. The panel clip receiver element having a base portion secured to one panel and two forwardly extending receiver sidewalls each terminating in inwardly rearwardly directed locking flanges. The panel clip secured to the other panel having an anchoring wall and a projecting tongue extending into the panel clip receiver between the locking flanges. Adjustable means permitting variable locking penetration of the projecting tongue into the receiver. The



forwardly extending receiver sidewalls may be inclined transversely inwardly toward each other at an angle of about 2° to 15° with respect to a plane perpendicular to the receiver base. The included angle between the locking flanges and the adjacent receiver sidewall being about 25° to 45°.

3,604,737
METHOD OF JOINING MATERIALS
Thomas A. Tarpey, Lynn, Mass., assignor to Xerox Corporation, Rochester, N.Y.
Filed Sept. 24, 1968, Ser. No. 762,060
Int. Cl. F16b *11/00;* **B25g** *3/28*
U.S. Cl. 287—20.3 **2 Claims**

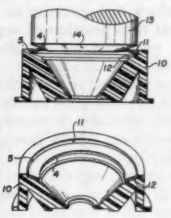


The method of joining a first encompassing member to a support member by inserting an elongated bushinglike element therebetween. The bushinglike element has a fulcrumed interior surface and is of a length such that a portion of the element extends exterior the encompassing member. The extended portion of the element is collapsed into locking or gripping contact with the support member. The opposite end of the element is expanded simultaneously into locking contact with the encompassing member as it is forced upwardly about the fulcrum.

3,604,738
METHOD OF ATTACHING A THIN, FLAT, RESILIENTLY DEFORMABLE RING TO A MATING COMPONENT AND PRODUCT
Daton William Alpaugh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed June 24, 1968, Ser. No. 739,291
Int. Cl. B23p *11/02, 19/02;* **F16b** *43/02*
U.S. Cl. 287—20.3 **7 Claims**

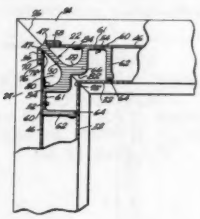
A method of attaching a thin, flat, resiliently deformable ring with an inner edge defining an inside dimension and an outer edge defining a perimeter to a component having a mating wall with a configuration similar to that of a first one of the edges of the ring, and having a contact surface for engaging a surface of a ring when attached to the component, The flat ring is formed into a dished shape such that the inside dimension is increased and the perimeter is reduced, and the dished ring is placed on the mating component with the first edge of the ring in contact with the contact surface and with the peripheral portion of the ring opposite the contacted first edge extending away from the contact surface. The outer edge of the ring is confined as pressure is then exerted

on the opposite periphery of the ring to snap that opposite periphery past the contacted first edge to reverse the direction of concavity of the ring and to bring a surface of



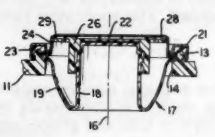
the ring into contact with the contact surface as the inside dimension is reduced and the outside perimeter is enlarged to form an interference fit with the mating wall of the component.

3,604,739
GUSSET PLATE FOR FRAME MEMBERS
Ray L. Carlisle, 301 S.W. 70 Terrace, Pembroke Pines, Fla.
Filed Dec. 15, 1969, Ser. No. 885,075
Int. Cl. F16b *5/00*
U.S. Cl. 287—189.36 **10 Claims**



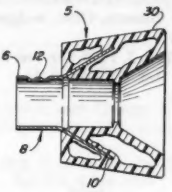
For use in joining the mitered ends of a pair of members having pockets, a corner gusset with a stem zone to overlay the mitered line of juncture and having a pair of legs and a pair of arms, with one of the legs and one of the arms extending generally in a common direction from the stem and the other of the arms and legs extending oppositely from the stem so that the legs are adapted to be received in the pockets at the end of the members to be joined in snug relation and the arm is adapted to clampingly embrace the sidewalls of the pocket so that the members joined cannot be separated and resist flexing.

3,604,740
CONTAINER CLOSURE COMBINATION
Kenneth L. Summers, Hudson, Ind., assignor to Rieke Corporation, Auburn, Ind.
Filed Feb. 4, 1969, Ser. No. 796,426
Int. Cl. B65d *45/32, 43/10*
U.S. Cl. 292—256.61 **10 Claims**



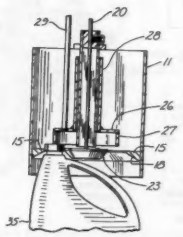
A plastic container with an opening in a wall thereof encompassed by a boss formed therein, has a plastic closure secured thereto around the opening by a rigid circular anchor ring of inverted U-shaped cross section, the boss having an outwardly projecting the lip disposed in interlocking relationship with an inwardly projecting bead on the anchor ring, with the closure base and boss below the bead squeezed together by crimping or by other means securing the anchor ring thereon.

3,604,741
DOORKNOB
Frank W. Steere, Jr., Akron, Ohio, assignor to Steere Enterprises, Inc., Tallmadge, Ohio
Filed Aug. 19, 1969, Ser. No. 851,423
Int. Cl. E05b *1/04*
U.S. Cl. 292—347 **2 Claims**



A cast hollow plastic knob which may be of flexible elastomeric material or hard material or a sponge, is formed with relatively rigid support means located interiorly to reduce or prevent any tendency for the knob to collapse when pressed or grasped. It may be a larger knob, e.g. a doorknob or a smaller knob, e.g. a cupboard or drawer pull. The support means may comprise an outwardly flaring extension of the tube which supports the knob, if a doorknob, or any one of a variety of other means. The knob is rotationally cast from any suitable material, for example, a plastisol, preferably a vinyl plastisol. It may be made of foamed polyurethane or foamed vinyl plastisol, etc., and for the latter construction a separate vinyl skin may cover the foam. It may be cast from a powder of nylon or other resin. The outward portion of the flaring support is usually so close to the inner wall of the cavity in which the knob is cast, that the plastic material bridges the gap between the two. The plastic is fused by heating during and/or after being cast.

3,604,742
APPARATUS FOR LIFTING OBJECTS WITH OFF-CENTER NECKS
Carlton S. Sprague, Huntington, Ind., assignor to Shuttleworth Machinery Corp, Huntington, Ind.
Filed Oct. 4, 1968, Ser. No. 765,249
Int. Cl. B66c *1/66*
U.S. Cl. 294—33 **8 Claims**



Apparatus for automatically lifting and handling objects having offcenter neck portions such as bottles or other containers. A cylindrical housing has an inwardly directed annular ridge at its lower end. A horizontal disc is suspended at

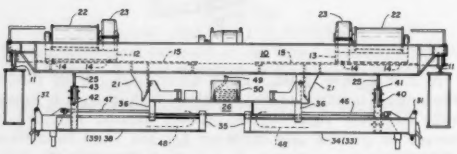
the lower end of a spring rod which is fixed at its upper end relative to said housing. The disc is positioned inwardly of the ridge and with said ridge defines an annular opening concentric with the housing and the disc. Because the neck of the bottle or container is container radially outwardly of the bottle center the same distance the annular opening is located from the housing center, the neck is gripped between the disc and the ridge no matter in what random orientation the neck is located. The rod resiliently and yieldably maintains the disc biased toward the center of said housing thus gripping the neck. A cylindrical ejector plunger is movable downwardly between said ridge and disc and concentrically thereof to eject the bottle from the housing.

3,604,743

ADJUSTABLE SPREADER BEAM STRUCTURES

Edward J. Kinkopf, Alliance, Ohio, assignor to The Alliance Machine Company

Filed Feb. 3, 1970, Ser. No. 8,307
Int. Cl. B66c *1/16*
U.S. Cl. 294—67 CA **6 Claims**



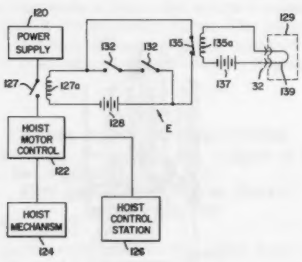
An adjustable spreader beam structure is provided with a wheeled trolley adapted to run on an overhead trackway, a pair of spaced sliding bases on said trolley, a cable drum and drive therefor on each of said bases, means for sliding said bases relatively to one another on said trolley, cables depend from each of said drums, a spreader beam suspended on said cables, said beams having a central member, a pair of extensible end members slidable on said central member, one inside the other and means on the central member moving said extensible end members in alignment with the cable drums.

3,604,744

CRANE COUPLING

Lawrence A. Wright, Alameda, Calif., assignor to Fruehauf Corporation, Detroit, Mich.

Division of Ser. No. 675,488, Oct. 16, 1967, Pat. No. 3,552,794
Int. Cl. B66c *1/00*
U.S. Cl. 294—67 **3 Claims**



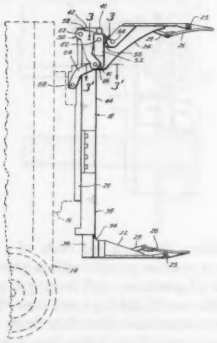
A crane coupling permitting rapid interchange of connection between a crane hoist block or other lifting apparatus and one of a plurality of remotely actuated spreaders of differing sizes, wherein each size of spreader is designed for handling uniformly sized cargo articles or containers of common dimension. To permit rapid change of such spreaders, the lifting apparatus hoist block and selected spreader each have complementary attachment members. These attachment members are adapted for quickly gathering and aligning the hoist block and spreader so as to guide them into slidable engagement to a position of registry. In the position of registry, a pin mounted for reciprocal movement with respect to one of the attachment members penetrates through an aperture defined in the other of the members in order to effect the desired attachment. As attached to the lifting apparatus the spreader is remotely actuated by nonload bearing connections, which connections are protected from inadvertent separation or severance. This protection is afforded by an interlock attached to the coupling and integrated with the lift apparatus that restricts movement of the hoist block when the pin is retracted and restores hoist movement upon manual separation of these nonload bearing connections.

3,604,745

TOGGLE ARM CLAMP FOR LIFT TRUCKS

Stuart W. Sinclair, Houston, Tex., assignor to Anderson, Clayton & Co., Houston, Tex.

Filed June 23, 1969, Ser. No. 835,660
Int. Cl. B66f *9/18*
U.S. Cl. 294—88 **5 Claims**



A lift truck clamp for paper rolls, or similar objects, having one swinging arm to increase the range of diameters which can be handled. A toggle linkage is used to control the movement of the swinging arm. The pivot point is so placed as to allow a much shorter swinging arm.

3,604,746

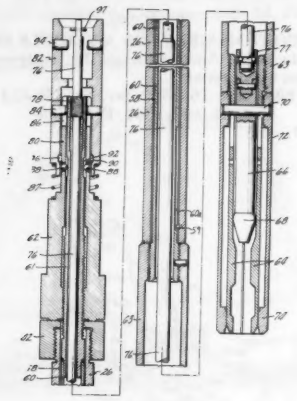
NUCLEAR REACTOR CONTROL ELEMENT GRIPPER AND DRIVE APPARATUS

Gennaro Vincent Notari, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of application Ser. No. 674,205, Oct. 10, 1967, now abandoned. This application Nov. 20, 1968, Ser. No. 777,401
Int. Cl. G21c *19/10*
U.S. Cl. 294—90 **10 Claims**

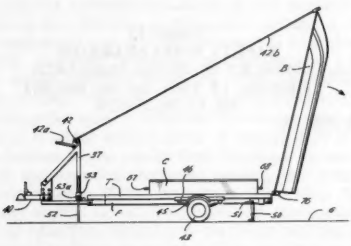
An apparatus for gripping, driving, and disconnecting control elements in a nuclear reactor having grippers mounted on an elongated support tube and gripper operators mounted on an elongated rod extending through the support tube and movable longitudinally therein to operate the grippers. The support tube is suspended from its upper end on a control element drive means by a nut and nut-locking mechanism. Unlocking and rotating the nut raises and lowers the support

tube and grippers between an operating position and a disconnecting position and raising and lowering the rod



within the tube operates the grippers. A plurality of control elements may be connected to a single drive assembly.

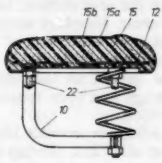
3,604,747
COMBINATION BOAT-TENT CAMPER-TRAILER APPARATUS
DeWitt Y. Gorman, P.O. Box 26323, Houston, Tex.
Filed Nov. 10, 1969, Ser. No. 875,293
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 **10 Claims**



A combination boat-tent camper-trailer apparatus wherein a tent camper is adapted to be removably mounted on a trailer with a boat removably disposed upsidedown over the tent camper on the trailer, whereby both the boat and the tent camper may be removed and floated together to a point remote from the launching thereof so that the tent camper is available at remote and otherwise inaccessible locations.

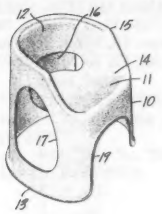
3,604,748
BICYCLE SADDLE
Klaus Lamkemeyer, 70 Huelsbrockstrasse, 4830 Guitersloh, Westphalia, Germany
Filed Apr. 21, 1969, Ser. No. 817,897
Int. Cl. B62j *1/18*
U.S. Cl. 297—214 **9 Claims**

A bicycle saddle comprising a rigid supporting body, a foamed cushion body formed thereon, and a cover skin over said cushion body, wherein said cushion body consists of an open-pore foam body merging by way of a zone of pores of reduced size into said external homogeneous cover skin, said



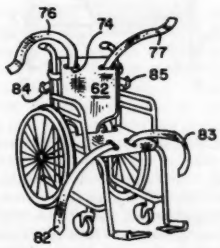
cushion body being connected inseparably to said supporting body during the course of manufacture in the foaming process.

3,604,749
CHAIR
George Parmett, Seaford, and George Schmidt, Douglaston, both of, N.Y., assignors to APL Corporation, Brooklyn, N.Y.
Filed Aug. 5, 1970, Ser. No. 61,340
Int. Cl. A47c *3/04*
U.S. Cl. 297—239 **6 Claims**



A one-piece stackable chair having a skirtlike frustum for supporting the elements of the chair, a seat formed integrally with the front of the frustum and extending toward the rear, and a curved back in front of the rear of the frustum and depending from the top of the frustum.

3,604,750
HARNESS
Esther W. Doering, 202 No. 9th Street, Olivia, Minn.
Filed Nov. 19, 1968, Ser. No. 776,979
Int. Cl. A47d *15/00*
U.S. Cl. 297—389 **24 Claims**



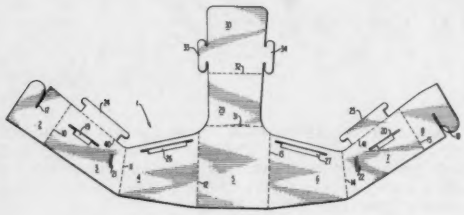
Harnesses are taught for converting a chair into a security chair to hold an individual in a sitting position while at the same time permitting comfortable shifting movements by the individual. The harnesses are first affixed to a chair and then body holding elements of the harnesses are used to secure a seated individual for safety.

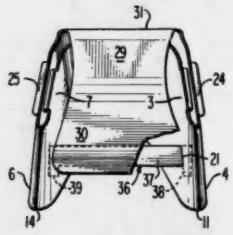
One type of harness especially useful for holding infants is formed from a length of flexible sheetlike material having the

following panels in sequence: A seat section, a back section, and a back overlap section which extends from the top of the upright back of a chair downwardly on the rear side. Flexible members or straps connected to the length of material are used to firmly fasten the seat section, back section, and back overlap panel to a chair. Shoulder straps affixed to the back section are crossed over the chest of an individual; and a crotch extension equipped with a sash or belt is drawn upwardly between the legs of an individual, connected to the crossed shoulder straps and then secured laterally and rearwardly of the individual.

The harness for adults or invalids likewise includes a seat section, back section and back overlap panel, preferably with an underseat panel interposed between the seat section and back section and a slot along the rear edge of the seat section through which the back section and back overlap panel are drawn after the seat section and underseat panel are stretched about the seat of a chair. Additionally, in the embodiment designed especially for use by adults, the long shoulder straps are preferably fixed at one end to the underseat section, and extended upward behind the back section to locations in the back section from which they are extended to cover the chest of the individual. The adult embodiment has separate thigh straps affixed to the seat section. They are adapted to be drawn separately upwardly between the legs of an individual and over his thighs.

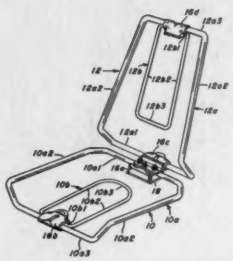
3,604,751
DECORATED DETERGENT-RESISTANT PAPER FURNITURE AND COATING SYSTEM THEREFOR
Robert A. Caigan, 1134 First Avenue, New York, N.Y.
Filed Apr. 18, 1969, Ser. No. 817,399
Int. Cl. A47c *9/12, 4/02*
U.S. Cl. 297—440 **8 Claims**





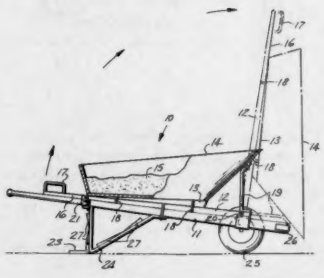
A chair is formed from a single blank of paper stock material coated with a decorative and detergent-resistant coating. The blank comprises panels separated by score lines. The panels, when folded along the score lines, form sides and each side comprises spaced outer and inner panels interlocked by cooperating slots and tabs, the tabs also serving as arm rests. The blank further provides end panels which overlay the panel forming the back of the assembled chair. A seat panel is secured to the top of the back panel by another panel which folds over the back panel and brings the seat panel to its proper position between the inner side panels. The seat panel is secured to the inner side panels by slots and tabs. A rail member extends between the inner side panels and further supports the seat. The coatings can be applied to any paper furniture. The coating is formed of elastic, mar-resistant paint layers which are based upon elastic polyester, elastic polyester polyurethane, elastic epoxy ester and elastic silicone resins for the intermediate and top layers. These resin materials have outstanding color retention and weather resistance and can be rubber or polished to a glossy finish to match the best grades of lacquers which are commercially available.

3,604,752
SUPPORT MEMBER FOR A VEHICLE SEAT
Albert J. Macknick, North Chicago, Ill., assignor to United States Steel Corporation
Filed Sept. 16, 1969, Ser. No. 858,423
Int. Cl. A47c *7/02;* **F16b** *7/00*
U.S. Cl. 297—455 **13 Claims**



A support member for a vehicle seat having a stationary member is disclosed. The support member has a support portion provided with a support torsion leg, opposed support cantilever legs projecting from the support torsion leg, and a second support cantilever leg connecting the support cantilever legs. One means of a first clamp means and a pivot means secures the support torsion leg to the stationary member. A spring portion of the support member has a spring torsion leg disposed adjacent one leg of the support torsion leg and the second support cantilever leg. Opposed spring cantilever legs project from the spring torsion leg and a spring connecting leg connects the spring cantilever legs. A second clamp means connects the spring torsion leg to the one leg.

3,604,753
SAFETY WHEELBARROW
Placide A. Couture, R.F.D., Dryden, Maine 04225
Filed Oct. 13, 1969, Ser. No. 865,801
Int. Cl. B62b *1/24*
U.S. Cl. 298—3 **3 Claims**



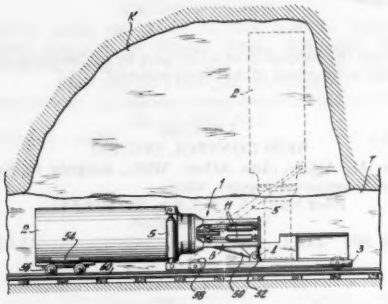
A wheelbarrow which will be safely dumped by listing a secondary frame secured to the body carrying the load. This device prevents possible injury to the user, the barrow from tipping from one side or the other, or going over too far while dumping the contents thereof. The device includes a secondary frame which is pivoted at the front end and has a pair of handles at the other end for grasping and lifting the body while the operator stands upon a foot rest.

3,604,754

APPARATUS FOR AND METHOD OF DRIVING A TUNNEL SHAFT

Gerd Kampf-Emden, Hosel; Heinz Horst, Rheinhausen, and Friedrich Klapdohr, Rheinhausen, all of, Germany, assignors to Demag AG, Duisburg, Germany

Filed Apr. 3, 1969, Ser. No. 812,984
Claims priority, application Germany, June 14, 1968, P 17 58 505.6
Int. Cl. E01g *3/03*
U.S. Cl. 299—18 19 Claims



An apparatus for driving a tunnel shaft includes a driving machine which is supported within an auxiliary shaft which is pivotally mounted on a wheeled track car in a position such that it may be raised to the desired drilling or angle by an associated positioning mechanism. The drilling machine is mounted within the auxiliary shaft in a tubular support which may be clamped in position in respect to the auxiliary shaft or when the drilling progresses clamped to the drilled tunnel shaft walls. The drilling tool is mounted in front of the driving motor in a manner such that it can be extended or retracted as desired. An advancing stroke mechanism carried on a frame supporting the auxiliary shaft is arranged to engage a tubular structure supporting the driving motor and advance it outwardly into the wall structure being drilled. The advanced tubular support structure is supported in its extended position by additionally supplied cylindrical supporting and carrying elements which are placed between it and the mounting base therefor on the under carriage as the tunnel is progressively formed. The structure is locked in each incremental advance position by transversely movable hydraulic wedge elements which are positioned behind support cams defined on the previously applied supporting structures until another support structure of a length equivalent to the advance is added behind them. A tunnel shaft is drilled from the bottom to the top by first forming a cavern at the bottom of the intended shaft and moving the drilling apparatus into position within the cavern. Thereafter the auxiliary tunnel shaft is raised to an elevation corresponding to the angle at which the tunnel is to be driven and the drilling tool is extended to form an initial drilling cut while its driving motor is supported within a tubular member located within the auxiliary shaft. After an initial cut is made the drilling member together with its driving motor is advanced outwardly and clamped against the wall of the tunnel which has been drilled at the exterior of the auxiliary shaft.

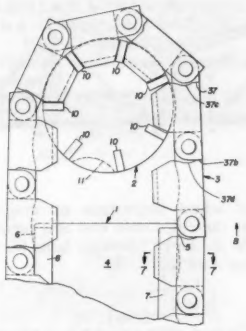
3,604,755

CUTTER BAR, CUTTER CHAIN AND SPROCKET ASSEMBLY

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Co., Cincinnati, Ohio

Filed July 24, 1969, Ser. No. 844,551
Int. Cl. E21c *25/30, 25/34*
U.S. Cl. 299—84 46 Claims

A cutter bar, cutter chain and sprocket assembly wherein means are provided to maintain the pintles joining the chain links in spaced relationship to and beyond the chain guide surfaces on the peripheral edges of the cutter bar. The ends of the pintles are free to extend beyond the exterior surfaces of the links they join, although they do not necessarily have to be so arranged. The pintles are preferably freely rotatable and means may be provided at their ends to hold the pintles in place with respect to the links they join. The pintles are so located and the link so configured that the line of force



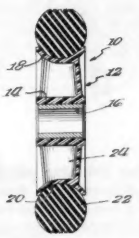
passing through the pintles also passes through body portions of the links which support cutter bits so that the distance between this line of force and the points of contact between the cutter bits and the material being mined is greatly reduced.

3,604,756

PLASTIC VEHICLE WHEEL

Peregrinus Gruber, Chicago, Ill., assignor to Circle Engineering Co., Inc., Chicago, Ill.

Filed Jan. 6, 1969, Ser. No. 789,154
Int. Cl. B60b *5/00*
U.S. Cl. 301—63 R 3 Claims



A plastic vehicle wheel for domestic and industrial use comprising a single molded member having a hub and a rim, with the intervening web formed as an imperforate sinuous ribbon folded back and forth around the wheel and having its body everywhere lying substantially on radii of the wheel so that compression resisting column or spoke means are formed which is much longer than the direct circumferential distance about the wheel at any radial point on said web.

3,604,757

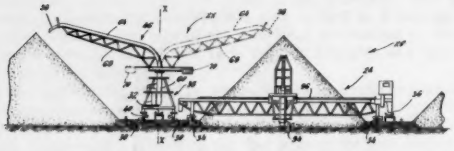
STACKING AND RECLAIMING SYSTEM

Gordon R. White, Montville, N.J., assignor to Hewitt-Robins Incorporated, Montville, N.J.

Filed June 2, 1970, Ser. No. 42,699
Int. Cl. B65g *53/04*
U.S. Cl. 302—13 6 Claims

A stacking and reclaiming system for storing wood chips in elongated, substantially homogeneous piles and for reclaiming the wood chips from storage on a first in—first out basis. The traveling stacker is a self-contained pneumatic assembly with the blower, chip feeder, discharge blow pipe assembly and power source all being mounted on the carriage. The

traveling stacker is fed from one of a first series stationary endless conveyor belts with a tripper that moves with the stacker effecting the transfer of chips from the particular conveyor belt to the feeder. The traveling reclaimer can be a



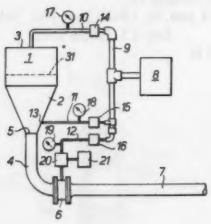
rotary bucket wheel screw-type or drag-type reclaimer, which deposits the chips onto one of a second series of stationary endless discharge conveyor belts for transport to the next processing station.

3,604,758

APPARATUS FOR THE CONVEYANCE OF COHESIVE PARTICULATE MATERIAL

Robert James Flain, and Brian Stanley Mawson, both of Stevenage, England, assignors to National Research Development Corporation, London, England

Filed Sept. 30, 1969, Ser. No. 862,407
Claims priority, application Great Britain, Oct. 2, 1968, 46814/68
Int. Cl. B65g *53/04*
U.S. Cl. 302—24 **12 Claims**



A method of piping cohesive particulate materials, to a delivery point, via a delivery pipe, from a mass flow hopper, the exit from which is too small for the hopper to empty by gravity alone, which comprises introducing gas under pressure into the space above the material in the hopper, introducing gas to the hopper at a point near but somewhat above the exit orifice in quantity insufficient to aerate the particulate material beyond the dense phase (i.e. not less than about 250:1 solid: gas mass ratio) and intermittently introducing gas into the delivery pipe at a point near to but somewhat beyond the junction of that pipe with the hopper exit orifice, to divide the particulate material in the pipe into discrete plugs.

Apparatus for the method may have an electrical oscillator for controlling the intermittent gas introduction into a jacket surrounding a short porous section of the pipe wall.

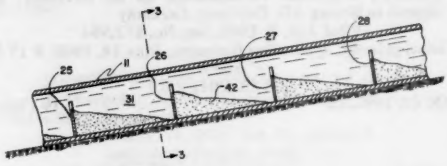
3,604,759

PARTIAL OBSTRUCTION ARRANGEMENT FOR PREVENTING PLUG FORMATION IN A SHUTDOWN SLURRY PIPELINE

Moye Wicks, III, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Sept. 23, 1969, Ser. No. 860,352
Int. Cl. B65g *53/34*
U.S. Cl. 302—64 **9 Claims**

Method and apparatus for preventing plug formation in a shutdown slurry pipeline. A plurality of partial obstructions are positioned in the pipeline in those sections of the line where inclination exceeds some predetermined critical angle



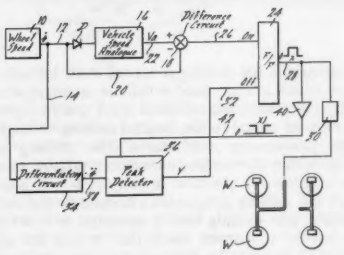
to prevent the formation of a line plug by interrupting slumping of the solid phase of the slurry material.

3,604,760

SKID CONTROL SYSTEM

Thomas M. Atkins, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Mar. 24, 1969, Ser. No. 809,543
Int. Cl. B60t *8/06*
U.S. Cl. 303—21 CG **12 Claims**



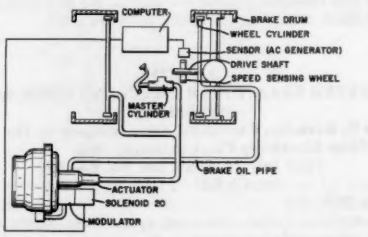
A skid control system for a wheeled vehicle having a plurality of wheels and a brake system for the wheels with the brake of at least one of the wheels being relieved upon the detection of an incipient skid condition and being reapplied when the spin-up or acceleration rate of that wheel is a maximum.

3,604,761

ANTISKID CONTROL SYSTEM

Atutoshi Okamoto, Toyohashi-shi; Noriyoshi Ando, Kariya-shi; Koichi Taniguchi, Kariya-shi; Yoshiaki Nakano, Gifu-shi, and Koichi Toyama, Toyohashi-shi, all of, Japan, assignors to Nippon Denso Kabushiki Kaisha, Kariya-shi, Japan

Filed June 12, 1969, Ser. No. 832,664
Claims priority, application Japan, Aug. 21, 1968, 43/59651
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 CG **2 Claims**



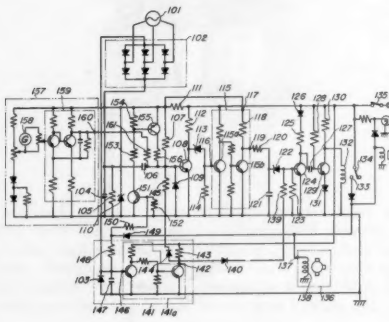
An antiskid control system so constructed that upon application of the braking force to the wheel, the maximum peripheral wheel deceleration developed in the wheel is

sensed and stored such that a peripheral wheel deceleration-sensing level is set automatically to a value such as 0.1 g., if said maximum peripheral wheel deceleration is large, while such peripheral wheel deceleration-sensing level is set automatically to a value of 0.8 g., for example, if said maximum peripheral wheel deceleration is small. Thus, this antiskid control system is highly adaptable to various coefficients of road adhesion, operating equally well on rough or slippery road surfaces.

3,604,762
ANTISKID DEVICE

Noriyoshi Ando, and Kazu Majima, both of Kariya-Shi, Japan, assignors to Nippon Denso Kabushiki Kaisha, Kariya-shi, Japan

Filed July 16, 1969, Ser. No. 842,131
Claims priority, application Japan, Oct. 31, 1968, 43/79446
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 BE **5 Claims**

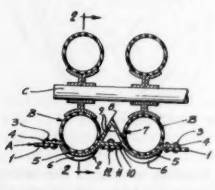


An antiskid device comprising an angular deceleration detector adapted to provide a braking force releasing signal when the angular deceleration of the wheel has exceeded a predetermined value, and a vehicle deceleration detector adapted to change said predetermined value in response to the rate of decrease in the speed of the vehicle, whereby said predetermined value is set to a lower value where the coefficient of road adhesion is low and a locked wheel is liable to occur such as in the case of a snowy frozen road surface and said predetermined value is set to a higher value where the coefficient of road adhesion is high and a locked wheel is not likely to take place, such as in the case of a dry asphalt road surface.

3,604,763
ENDLESS TRACK FOR TRACK-LAYING VEHICLES

John C. Maguire, deceased, late of Cookshire Highway, Lennoxville, Quebec, Canada (by Ivy Maguire, administrator and executrix)

Filed June 27, 1969, Ser. No. 837,379
Int. Cl. B62d *55/24*
U.S. Cl. 305—35 EB **5 Claims**

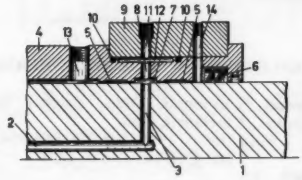


An endless track for track-laying vehicles having pairs of tire wheels on each side thereof, the endless track consisting of three endless belts interconnected by rigid cross links having a pair of curved portions to receive the tires of a tire wheel, and an inwardly extending V-shaped track guard engaging the inner sides of the tires to prevent the endless track from coming off the tire wheels.

3,604,764
DEVICE FOR SEALABLY TRANSFERRING A LIQUID BETWEEN A STATIONARY HOUSING AND A ROTATABLE SHAFT

Willem Daane, Vlijmen, Netherlands, assignor to LIPS N.V., Drunen, Netherlands

Filed June 5, 1969, Ser. No. 830,803
Claims priority, application Netherlands, June 5, 1968, 6807878
Int. Cl. F16c *33/10*
U.S. Cl. 308—5 **5 Claims**

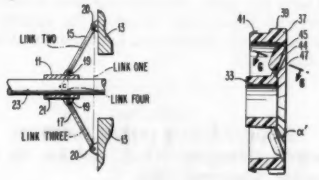


A device for transferring a liquid between a stationary housing and a shaft rotatably disposed therein includes a chamber in the housing communicating with a radial channel in the shaft, slide bearings disposed between the housing and the shaft on either side of the chamber and a compensating chamber in the housing having a diameter greater than the diameter of the first chamber whereby liquid pressure in the compensating chamber compensates for the pressure of liquid leaking past the slide bearings.

3,604,765
SELF-ALIGNING BEARING

David H. Babcock, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 23, 1969, Ser. No. 835,363
Int. Cl. F16c *13/00, 27/00*
U.S. Cl. 308—15 **8 Claims**



A self-aligning bearing is constructed on the principle of a four-bar linkage. The bearing comprises a foundation, a bearing element, and a series of connecting struts which are flexibly joined to the foundation and bearing element.

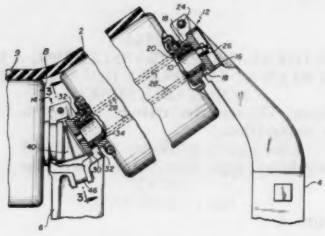
3,604,766
SUPPORT ASSEMBLY FOR IDLER ROLLS

William F. Bankauf, East Paterson, and Daniel J. Di Antonio, Nutley, both of, N.J., assignors to Hewitt-Robins Inc.

Filed Dec. 15, 1969, Ser. No. 884,944
Int. Cl. B65g *15/60;* **F16c** *13/00;* **F16n** *7/24*
U.S. Cl. 308—20 **7 Claims**

A support assembly for supporting both the outer ends and the adjacent ends of shafts for idler rolls has the capped ends of the shafts disposed in horizontally extending openings or slots provided in bracket members of the assembly. Grommets disposed in the brackets which receive the adjacent ends of idler roll shafts permit lubricant to be transferred

between the capped ends of the shafts, and cover members detachably mounted on the bracket members retain the



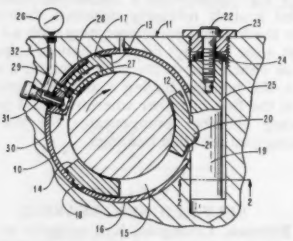
capped shaft ends in place and the grommets in their operable positions.

3,604,767

ADJUSTABLE PIVOTED SHOE BEARING AND METHOD OF ADJUSTING

Jacob Decker, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Oct. 6, 1969, Ser. No. 863,996
Int. Cl. F16c *17/06, 1/24*
U.S. Cl. 308—73 **24 Claims**



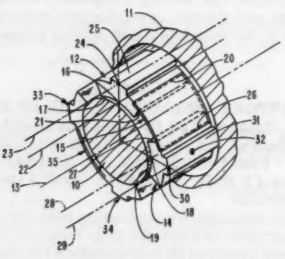
One of the pivoted bearing shoes of a shoe bearing for a rotating spindle is adjusted relative to the spindle in accordance with the oil pressure between the bearing shoes and the spindle. The adjustment of the one bearing shoe changes the clearance of the bearing shoes so that all of the bearing shoes will have the same clearance relative to the spindle in accordance with the desired speed of the spindle that corresponds to a specific oil pressure between the other bearing shoes and the spindle.

3,604,768

BEARING SHOE CONSTRUCTION

Jacob Decker, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Sept. 8, 1969, Ser. No. 856,102
Int. Cl. F16c *17/06*
U.S. Cl. 308—73 **9 Claims**



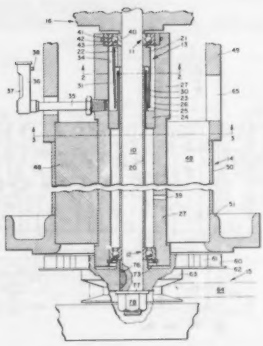
Two bearing shoes, each of which has a wrap angle no greater than 60°, are connected to each other by a thin piece of spring steel to provide a resultant wrap angle of the connected bearing shoes on a spindle of preferably greater than 90°. The piece of spring steel bears against retaining surfaces on the two bearing shoes with the retaining surfaces being parallel to axes of the highest points of the arcs of the spindle contacting surfaces. Because of the flexibility of the spring steel, each of the bearing shoes can rock relative to the other. The bearing shoe, which is first passed by the spindle during its rotation, is fixed to the housing.

3,604,769

TEMPERATURE-CONTROLLED SPINDLE FOR CENTRIFUGES AND SIMILAR APPARATUS

Allen Latham, Jr, Jamaica Plain, Mass., assignor to Cryogenic Technology Inc., Waltham, Mass.

Filed Sept. 23, 1968, Ser. No. 761,663
Int. Cl. F16c *37/00, 33/66*
U.S. Cl. 308—76 **9 Claims**



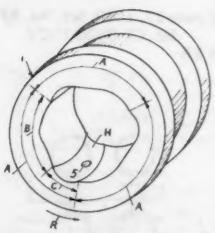
An oil and air cooled rotating spindle. By means of an oil flow path, heat sinks and air-cooled surfaces, the spindle during operation may be constantly maintained at or near ambient temperature thus preventing any changes in temperature of the apparatus rotated by the spindle and hence in any material contained in the apparatus.

3,604,770

HYDRODYNAMIC BEARINGS

Henri Peltier, and Francois Lhomme, both of Billancourt, France, assignors to Regie Nationale Des Usines Renault, Billancourt, France

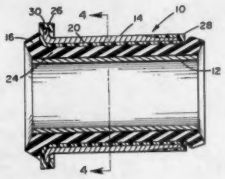
Filed Mar. 26, 1970, Ser. No. 22,891
Claims priority, application France, Mar. 26, 1969, 6908908
Int. Cl. F16c *33/66*
U.S. Cl. 308—240 **3 Claims**



Hydrodynamic bearing of which the internal surface provides a clearance for an oil film in relation to the shaft surface to be rotatably mounted therein, said internal surface being corrugated to create at least three oil overpressure areas for centering said shaft during its rotation, characterized in that said corrugated surface comprises, for each

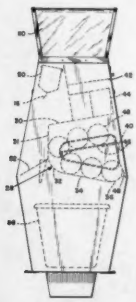
overpressure area, a contour of substantially sinusoidal pattern corresponding, in the direction of rotation of the shaft, to more than one half-sinusoid having a concave initial portion followed by a larger convex portion creating the hydrodynamic shaft bearing area, said convex portion being furthermore followed by another contour more concave than the preceding one, which constitutes an oil reserve, the generatrices of said contour being curved with a median convexity extending in the direction of rotation of the shaft.

3,604,771
RESILIENT BEARING
Steven O. Luzsicza, Huron, Ohio, assignor to Clevite Corporation
Filed Dec. 8, 1969, Ser. No. 882,842
Int. Cl. F16f *1/38;* **F16c** *33/20, 27/00*
U.S. Cl. 308—238 **7 Claims**



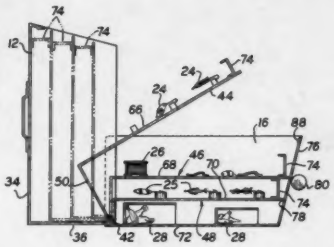
A resilient bearing having an inner and an outer tubular member with a rubber bushing compressed therebetween. The rubber bushing has ribbed areas to permanently retain a lubricant. The outer member which faces the ribbed surface is encapsulated by a plastic liner which is shrunk in situ on the outer member to provide mechanical locking and a tight seal.

3,604,772
DISPLAY STORAGE AND DISPENSING CABINET
Harvey J. Smith, 1211 Buckingham Rd., Greensboro, N.C.
Filed Aug. 15, 1969, Ser. No. 850,611
Int. Cl. A47f *5/08;* **B65b** *59/00*
U.S. Cl. 312—35 **9 Claims**



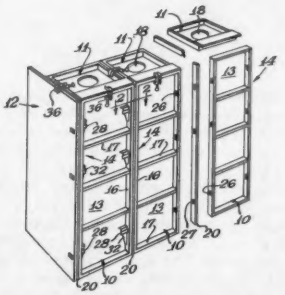
A display, storage and dispensing cabinet for canned goods, tools, and cleaning equipment normally associated with the servicing of vehicles wherein one side of the cabinet is a mirror image of the opposed side such that each includes a storage compartment having a canned goods guide means therein for defining display and dispensing areas, and a service compartment for receiving therein tools and cleaning materials. A receptacle, accessible from either side of the cabinet through removable closures, is located within a lower cabinet housing for collecting empty cans deposited therein.

3,604,773
FISHING LURE CONTAINER
John M. Haynes, 139-44 87th Rd., Jamaica, N.Y., and George E. Moritz, 459 Haworth Avenue, Haworth, N.J.
Filed Oct. 27, 1969, Ser. No. 869,767
Int. Cl. A47b *95/02*
U.S. Cl. 312—244 **7 Claims**



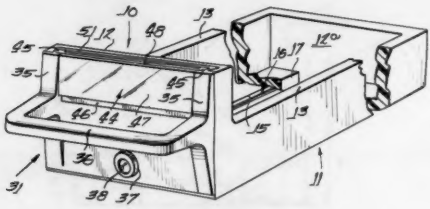
A container comprising a first housing member and a second housing member which together form a pair of opposed exterior housing members cooperating to define an internal storage compartment pivotally mounted to each other for opening and closing movement about a pivot axis oriented transversely of and enclosed within one corner of said storage compartment, and L-shaped internal members, each of said L-shaped internal members having one end of one of the L-shaped members attached directly to and pivotally mounted on said pivot axis, whereby said L-shaped internal members are adapted to be successively pivoted through said opening movement preparatory to successive use of each, and whereby the legs that are directly attached to said pivot are in stacked side-by-side relationship when said container is closed and also when said container is open and all of said L-shaped members have been pivoted.

3,604,774
BOOTH ASSEMBLY
John R. Furman, Chicago, Ill., assignor to Rae Systems, Inc., Chicago, Ill.
Filed Nov. 22, 1968, Ser. No. 778,258
Int. Cl. A47b *47/00*
U.S. Cl. 312—263 **7 Claims**



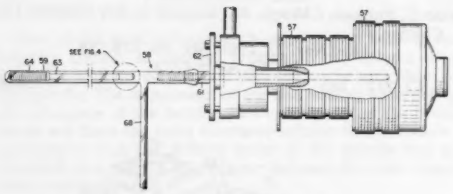
A booth assembly or the like includes a plurality of panels which contain slotted apertures. A U-shaped fastener member is inserted through the apertures of adjacent panels and is anchored at one end to a first of the panels and the other end to the other panel by a wedge member which is inserted through the U-shaped fastener member. The panels may be arranged in side-by-side relationship or at angles to each other and in one embodiment a strip may be further sandwiched between the panels for supporting shelving. In another embodiment a smooth cover sheet may be provided on a face of each of the panels and anchored in position by a strip which is also sandwiched between the respective panels.

3,604,775
FILE DRAWER ASSEMBLY
Ralph F. Anderson, and Frank J. Krieps, both of Rockford, Ill., assignors to Keystone Consolidated Industries, Inc., Peoria, Ill.
Filed May 1, 1969, Ser. No. 820,794
Int. Cl. A47b 88/00
U.S. Cl. 312—330 6 Claims



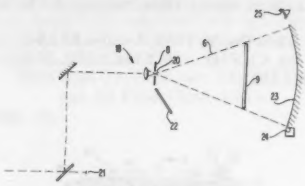
A library or file drawer assembly formed of a plastic material and having an integral construction of the front, rear and sidewalls and a bottom wall containing a central track for a follower to be adjustably retained in position in the drawer. The drawer front has an undercut recess therein to receive a drawer front panel retained by a dovetail connection and which includes an integral handle for the drawer, an opening for reception of a rod to extend through the drawer, and a smaller undercut recess to receive a label holder.

3,604,776
HIGH-VOLTAGE, LOW-BACKGROUND ELECTRONIC CAMERA
Gerald E. Kron, Flagstaff, Ariz., assignor to The United States of America as represented by the Secretary of the Navy
Filed Dec. 22, 1969, Ser. No. 887,233
Int. Cl. H01j 9/18, 9/38
U.S. Cl. 316—4 6 Claims



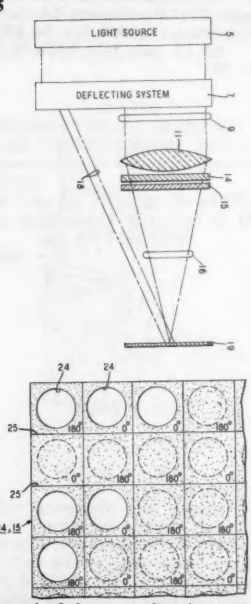
Electron cameras or image tubes employ a photoemissive semitransparent cathode upon which light may be focused to emit electrons which then are focused by electron optics either directly upon an electron-sensitive recording material or upon a phospher which provides recorded data for subsequent analysis. The high sensitivity of these cameras renders them particularly useful for direct astronomical studies although the problem of high-background interference due to field emission and other related phenomena have imposed serious limitations upon existing image tubes. The present method permits operation of these tubes at voltages up to external breakdown potentials by providing a tube-fabrication process that eliminates sharp points and assures cleanliness of the electrodes. Undesirable field emissions thus are minimized. The electrodes or electronic lens members are formed initially by machine-working relatively massive tubular metal parts into the final desired tubular shape of the electronic lens members. The wall thickness of these massive parts must be greater than the maximum thickness of the tubular walls of the final shape of the members. When formed, the lens shapes are polished and mounted with the photocathode in operative disposition. To assure the cleanliness, a vacuum is created and a source of electron-emissive material then moved through the vacuum into close proximity with the mounted photocathode. The source is heated to promote a vapor-transfer directly onto the photocathode. Selective deposition of the source material is assured by heating the electronic lens members while maintaining the cathode in a relatively cool condition.

3,604,777
RETURN BEAM HOLOGRAPHY
Einar S. Mathisen, Poughkeepsie, and Leonard S. Sheiner, Wappingers Falls, both of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 21, 1969, Ser. No. 868,146
Int. Cl. G02b 27/22
U.S. Cl. 350—3.5 13 Claims



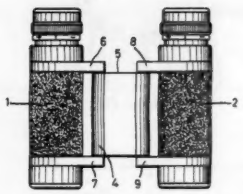
Method and apparatus for constructing and reconstructing a hologram, whereby the hologram is reconstructed upon the original image plane used in constructing the hologram, by use, in one embodiment, of a spherical mirror placed to reflect divergent light originally passing through the hologram, back through the hologram as convergent light. Included are liquid gate means for reducing reflection glare from the hologram onto the reconstructed image.

3,604,778
FOURIER TRANSFORM RECORDING WITH RANDOM PHASE SHIFTING
Christoph B. Burckhardt, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Oct. 22, 1969, Ser. No. 868,485
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 9 Claims



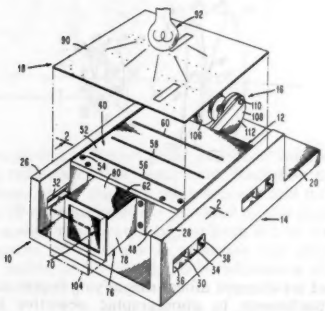
In making a record of the exact Fourier transform of an array of beams of electromagnetic radiation, the phase of each of a substantial fraction of the beams is shifted by a constant amount before recording the transform.

3,604,779
BINOCULAR FIELD GLASS WITH DOUBLE JOINT
Liebmann Reinhold, Oberkochen/Wurttemberg, Germany, assignor to Carl Zeiss-Stiftung, Wurttemberg, Germany
Continuation-in-part of application Ser. No. 818,494, Apr. 23, 1969, now abandoned. This application Sept. 30, 1970, Ser. No. 77,028
Int. Cl. G02b 7/12
U.S. Cl. 350—75 1 Claim



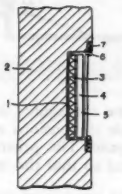
A binocular field glass in which the two individual telescopes are connected with each other by a bridge forming a double joint and made of two members with oppositely disposed flat faces, each having spaced parallel semicircular precision finished recesses therein to receive two hinge pins accurately parallel with the axes of the telescopes. A single centrally arranged threaded connection holds the two bridge members together, whereby the walls of the recess frictionally engage the hinge pins.

3,604,780
THREE-DIMENSIONAL FIBER OPTIC DISPLAY
Martin Martin, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 1, 1969, Ser. No. 820,976
Int. Cl. G02b 5/16
U.S. Cl. 350—96 B 7 Claims



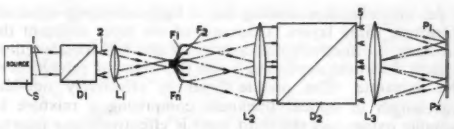
A three-dimensional display apparatus is disclosed, having a fixed coded input source, a movable carriage carrying fiber optic elements with their input ends arranged adjacent the input source and their output ends arranged in a display face. In operation, the carriage is oscillated and a plurality of planes of an object are repeatedly displayed within a set volume by the input face, at a rate sufficient to prevent flicker.

3,604,781
REFLECTOR FOR WARNING ROAD TRAFFIC OF ICING CONDITIONS
Rudolf Gaeth, Limburgerhof; Karl Hagen, Friedelsheim; Hans-Joachim Orthmann, Limburgerhof, and Karl Gustav Linn, Hochdahl, all of, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Filed Nov. 26, 1969, Ser. No. 880,046
Claims priority, application Germany, Dec. 3, 1968, P 18 12 319.8
Int. Cl. G02b 5/12
U.S. Cl. 350—97 7 Claims



A reflector containing a light-reflecting layer, particularly for affixation to road edge marker posts, for warning traffic of the existence of icing conditions. The reflector consists of a transparent capsular container located in front of a light-reflecting layer and filled with a liquid which extends over the surface of the layer, and which as a result of a change of state loses the transparency it possesses at higher temperatures when temperatures just above the freezing point of water prevail.

3,604,782
ELECTRO-OPTICAL LIGHT DEFLECTION SYSTEMS
Marcus John Dore, Bournemouth, England, assignor to National Research Development Corporation, London, England
Filed Aug. 13, 1969, Ser. No. 849,760
Claims priority, application Great Britain, Aug. 16, 1968, 39232/68
Int. Cl. G02f 3/00
U.S. Cl. 350—150 4 Claims

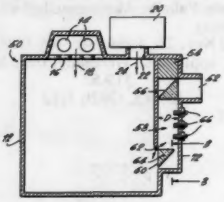


Electro-optical light deflector apparatus in which electro-optically active deflector stages are used alternately with passive deflector stages comprising arrays of fiber-optic light guides having their input ends close together in a line and their output ends spaced apart.

3,604,783
MICROWAVE CAVITY VIEWERS
Howard Roth, Bronx, N.Y., assignor to DCA Food Industries Inc., New York, N.Y.
Filed June 30, 1969, Ser. No. 837,446
Int. Cl. F23m 7/00
U.S. Cl. 350—163 6 Claims

Viewing ports for microwave ovens. In a first embodiment, a transparent mirror is placed over a relatively large aperture in the wall of the oven with the metallic coating of the mirror bearing against the metallic wall of the oven. The interior of the oven is illuminated. The metallic coating of the mirror prevents microwave energy from being transmitted through the mirror, while the one-way viewing characteristic of the mirror allows visible light to be transmitted through it. In a second embodiment, a waveguide is connected between the

aperture in the oven and a viewing port. Two prisms are provided, one at the oven aperture and the other at the viewing port. Visible light from inside the oven is reflected by the aperture prism down the waveguide and by the viewing port prism out of the viewing port. Any microwave energy which



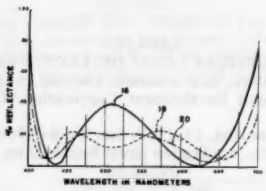
is transmitted down the waveguide is attanuated both as a result of the waveguide dimensions and special attenuators provided for this purpose. The prism mounted at the oven aperture can be rotated so that the interior of the oven can be scanned.

3,604,784

ANTIREFLECTION COATINGS

Anthony W. Louderback, Long Beach, and Morris A. Zook, Jr., Monterey Park, both of, Calif., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jan. 21, 1969, Ser. No. 792,543
Int. Cl. G02b *1/10*
U.S. Cl. 350—164 **5 Claims**



An antireflection coating for a light-reflecting substrate substitute three layers. Thickness of the layer adjacent the substrate is effectively one-quarter or one-half wavelength in optical thickness depending upon the index of refraction of the substrate. The middle layer is effectively one-half wavelength in optical thickness comprising a mixture of metallic oxides and the third layer is effectively one-quarter wavelength in optical thickness. A method of applying the middle layer of the coating employs directing a stream of oxygen at an electron beam which is directed at a source of coating material.

3,604,785

WAVELENGTH SEPARATION IN MULTICOLOR FLUORESCENT MARK CODE READERS

David Neil Travis, and John William Berry, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 23, 1969, Ser. No. 887,522
Int. Cl. G02b *17/08*
U.S. Cl. 350—195 **3 Claims**

An optical reader for a plurality of narrow wavelength radiation bands, for example those derived from coded inks with narrow band photoluminescent materials as the coding components, comprises two independently adjustable spherical mirrors of radius of curvature R arranged side by side and a planoconvex lens of focal length R with the convex side toward the mirrors and arranged so that the normal to the lens passes symmetrically between the two mirrors and so that the lens and mirrors are separated by a distance R. In the planar surface of the lens are situated a clear entrance aperture and several interference filters, the interference filters being arranged in one or more rows and each one passing the narrow band radiation corresponding to the photoluminescent bands of the different coding components. The spherical half mirrors are adjusted so that the entrance aperture is reflected back and forth to produce images centered on each interference filter. When an image of the en-

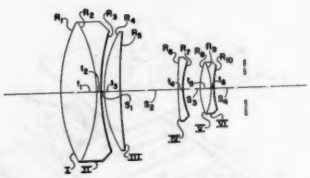
trance aperture is imaged onto a portion backed by an interference filter, the filter passes only one band of wavelengths, reflecting the others back onto the mirrors. Two of the images involve only one reflection and other sets, two, three, four, etc. With a total of four possible reflections, eight coding components can be accommodated. Behind each interference filter is a detector sensitive to light of that particular wavelength.

3,604,786

COMPACT AFOCAL MAGNIFYING LENS

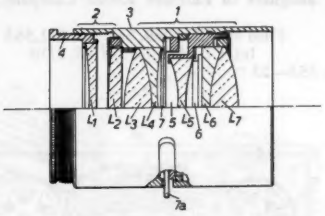
James G. Baker, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 22, 1969, Ser. No. 843,707
Int. Cl. G02b *3/02, 3/04*
U.S. Cl. 350—212 **14 Claims**



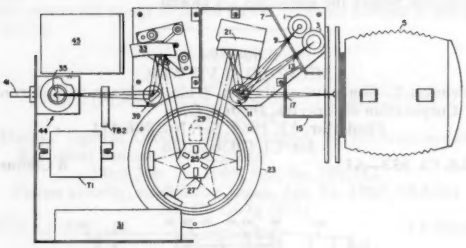
Compact six-element afocal magnifying lenses suitable for use as attachments to photographic objective lenses are described. The overall length of an afocal lens designed according to this invention is less than the focal length of the photographic objective lens with which it is to be associated. Magnifications as high as 2 power are attainable. Three elements are arranged in a positive front group, separated by a large air space from the other three elements which are arranged in a negative rear group. The outer elements in each group of three have higher Abbe values than the inner element of their respective group. High refractive indices are employed in the negative elements and moderate refractive indices in the positive elements. Chromatic and spherical aberrations, coma, astigmatism, field curvature, and distortion can be corrected. An aspheric surface is used.

3,604,787
VARIABLE TRACK LENGTH PHOTOCOPIER LENS SYSTEM
Peter Arnold Merigold, Prestatyn, Flintshire, and Philip J. Rogers, Meliden, Flintshire, both of, Wales, assignors to Pilkington Perkin-Elmer Limited, Liverpool, England
Filed May 16, 1969, Ser. No. 825,209
Claims priority, application Great Britain, May 21, 1968, 24206/68
Int. Cl. G02b 7/04, 9/26, 9/60
U.S. Cl. 350—216 2 Claims



An optical lens system comprises a symmetrical anastigmatic lens unit in combination with a two-element variable-power unit which permits variation in the total distances between the object and image planes with maintained aberration correction.

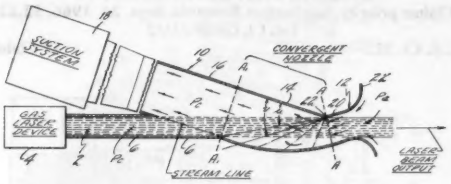
3,604,788
MICROSECOND RADIATION PULSE GENERATOR
Wayne S. Paige, Shelton, Conn., and Walter A. Mannherz, Springfield, Va., assignors to The United States of America as represented by the Secretary of the Army
Filed Nov. 2, 1967, Ser. No. 680,142
Int. Cl. G02f 1/34; G01j 3/00
U.S. Cl. 350—285 3 Claims



A microsecond radiation pulse generator for the purpose of testing radiometer type equipment. Radiation pulses having rise times better than 0.3 microseconds and pulse widths as long as 10 microseconds are provided by this generator. Its radiation covers the spectral region from 0.2 to 10 microns. Three sources of controllable radiation are provided: ultraviolet, visible, and infrared. Their radiation is chopped by a radiation chopper.

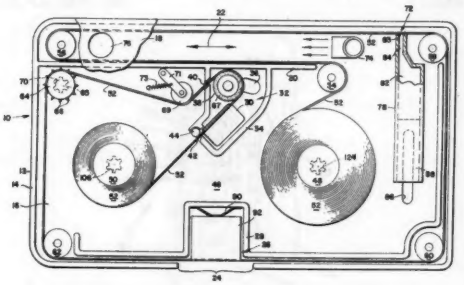
3,604,789
AERODYNAMIC WINDOW
George H. McLafferty, Manchester, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed May 23, 1968, Ser. No. 731,656
Int. Cl. G02b 5/00
U.S. Cl. 350—319 5 Claims

An output beam is emitted from a gas-dynamic laser and directed through an opening or port to the atmosphere. The gas pressure on the side of the opening from which the laser beam is emitted is below atmosphere (for example, 0.10 atmosphere) and the pressure on the outside of the opening is atmospheric. To prevent flow in said opening between the atmospheric side of the opening and the low-pressure side of the opening in the gas laser, the beam is directed through an aerodynamic window. The aerodynamic window is an opening formed in the sidewall of a passageway and placed in line with the inlet to the passageway so that a laser beam can pass through the opening and out the inlet, the path being unobstructed by attenuating or disturbing materials. The passageway is formed having an inlet section with a short section of constant area and a faired inlet mouth. At the downstream end of the inlet section the passageway bends at



an angle forming a sharp corner and extending away from the proposed path of the laser beam. This side of the passageway extends as a straight line. The side opposite the straight side extends on in the same direction as an extension of the short section of constant area and this curves gradually towards the straight side until it becomes parallel therewith. The passageway then extends until it is connected to suction means to obtain the desired pressure characteristic in the passageway so that ambient air does not flow into the opening in the sidewall of the passageway and into the laser cavity.

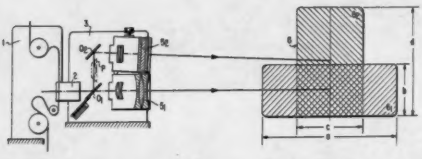
3,604,790
MULTIPURPOSE CASSETTE INCLUDING SOUND RECORDING AND PLAYBACK STATION
Edwin H. Land, Cambridge, and Rogers B. Downey, Lexington, both of, Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Jan. 21, 1969, Ser. No. 792,733
Int. Cl. G03b 31/02, 23/02; G03d 5/00
U.S. Cl. 352—29 15 Claims



A motion-picture-film-handling cassette, adapted to be mounted in a camera for exposure operations and in a projector for projection operations, which includes a sound recording and playback station. The filmstrip contains a soundtrack and is advanced from an initial position within a light-sealed section of the cassette through an exposure station and the sound recording and playback station and then back into the light-sealed section. The sound-recording station is adapted to receive a sound transducer of the projector into operative relationship to the filmstrip. Intermediate of the film exposure station and the sound recording and playback station, a sprocket, adapted to be driven in unison with the claw mechanism of the projector, engages the filmstrip. Immediately prior to coming into operative relationship with the sound recording and pickup head, the filmstrip is

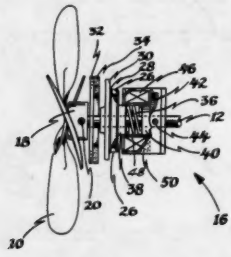
gripped between the idler of the cassette and a capstan, the latter element having a flywheel attached thereto and forming part of the projector so as to extend into the cassette.

3,604,791
SYSTEM (PROCESS) AND DEVICE FOR FILMING AND PROJECTION OF CINEMA FILM FOR VARIABLE SCREEN
Vasile Baltatu, Bucharest, Romania, assignor to Comitetul De Stat Pentru Cultura Si Arta, Bucharest, Romania
Filed Sept. 21, 1967, Ser. No. 669,474
Claims priority, application Romania, Sept. 24, 1966, 52,226
Int. Cl. G03b *21/32*
U.S. Cl. 352—40 **17 Claims**



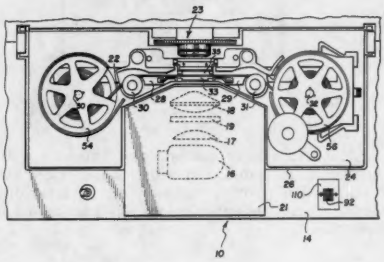
A method and apparatus for producing motion pictures which are elongated either horizontally or vertically to suit the artistic requirements of particular scenes. In addition to the normally horizontally elongated images, extra-wide images may be projected if desired. A motion picture camera is provided for making a cinema film in which horizontally elongated picture frames on the strip may carry either horizontally elongated images or vertically elongated images. These images may be anamorphosed. The result is a filmstrip having these images on it, along with the vertical images and deanamorphosed the anamorphosed images. The projector exhibits the images on a motion picture screen which has an inverted T-shape.

3,604,792
SINGLE FRAME CINEMATIC PROJECTOR
Charles Woodruff, New York, N.Y., assignor to Visual Instruction System, Inc., New York, N.Y.
Filed Feb. 6, 1969, Ser. No. 797,123
Int. Cl. G03b *21/38*
U.S. Cl. 352—169 **10 Claims**



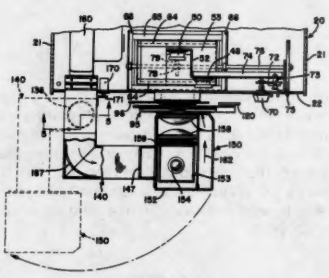
A drive motor for a motion picture projector is normally connected to the shutter mechanism thereof by means of a clutch which is spring-biased to the engaged position, but a solenoid disengages the clutch after a single frame advance. A pair of switches, one manual and the other cam operated, are arranged so that the solenoid is normally deenergized, causing the clutch to be normally engaged and the shutter mechanism to be normally operative. But a cam driven by the shutter shaft transfers one of the switches so as to stop the film advance precisely at a frame display point, thus freezing a single frame on the screen. The manual switch may then be momentarily operated so as to open the circuit of the solenoid, allowing the shutter mechanism to advance through one frame cycle. At the conclusion of that cycle, the next operation of the cam switch restores those conditions which reenergize the solenoid, disengage the clutch, and thus cause the projector to stop and freeze the next frame. Thus the projector can be advanced one frame for each operation of the manual switch. A third switch converts the projector to the continuous frame mode by holding the clutch solenoid circuit continuously open. A cooling fan is operable from the motor drive shaft and is independent of the clutch, so that cooling continues during stop motion operation.

3,604,793
CONTROL FOR STRIP-DRIVING APPARATUS
Elmer O. Wangerin, and Donald P. Welty, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 5, 1969, Ser. No. 821,563
Int. Cl. G03b *1/42, 1/48, 1/50*
U.S. Cl. 353—23 **13 Claims**



A control circuit for a strip-driving apparatus wherein a strip of a material such as photographic film is driven from a supply reel to a takeup reel between a pair of transparent flats. The control circuit serves to regulate the speed and direction of a motor connected to the takeup and supply reels, to open the transparent flats to allow the strip to be driven therebetween without scratching the strip and also to provide a delay dependent upon the time for which the strip is driven, before the glass flats are closed.

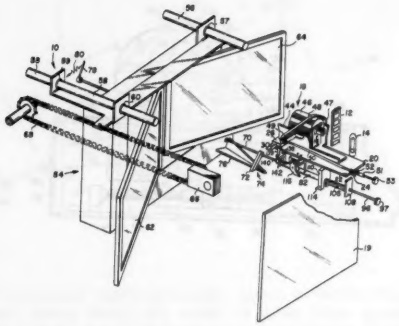
3,604,794
MICROFILM VIEWER
Nicholas T. Simopoulos, Dayton, Ohio, assignor to Labtron Corporation of America, Dayton, Ohio
Filed Mar. 12, 1969, Ser. No. 806,471
Int. Cl. G03b *21/16*
U.S. Cl. 353—61 **8 Claims**



A microfilm projector incorporates a panel which supports a vertical film holder rotatable through 360° and movable both vertically and horizontally for scanning large transparencies and orienting an image on a screen. Selectable lenses are supported by the panel rearwardly of the film holder, and a lamp box is supported in front of the film holder by a ductlike arm pivotally mounted on the panel to provide convenient access to the film holder as well as convenient interchangement of the film holder with a continuous film system. The lamp box is cooled by blowing air through the

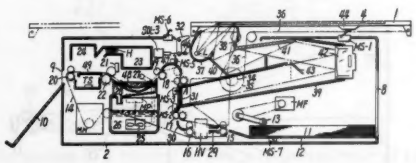
arm from a blower supported by the panel within a cabinet which may support a back-lighted viewing screen or have a transparent wall for projecting onto a remote viewing screen.

3,604,795
IMAGE PROJECTION SYSTEM
Robert P. Crandall, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 20, 1968, Ser. No. 730,316
Int. Cl. G03b *21/22, 21/28, 27/34*
U.S. Cl. 353—76 10 Claims



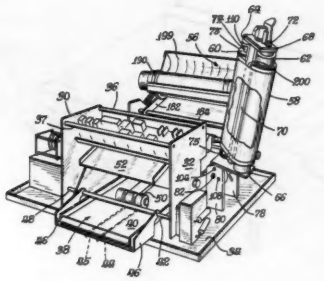
Apparatus is disclosed for projecting an image onto a display surface with varying degrees of magnification and having the capability of selectively projecting various portions of the image. This apparatus is capable of incorporating a plurality of different lenses and illustratively includes a reflective surface, which is movably mounted to increase or decrease the long conjugate distance between the lens and the display surface. The selected lens is inserted within the apparatus at its given focal distance from the transparency to be projected and is manipulated by a follow focus mechanism to maintain the projected image in focus as the reflected surface is being moved.

3,604,796
MULTIPLE-COPY ELECTROSTATIC MACHINE CONTROL
Masaya Ogawa, Osaka, Japan, assignor to Minoltracamera Kabushiki Kaisha, Osaka, Japan
Filed Jan. 10, 1969, Ser. No. 790,312
Claims priority, application Japan, Jan. 31, 1968, 43-6461
Int. Cl. G03g *15/22*
U.S. Cl. 355—14 3 Claims



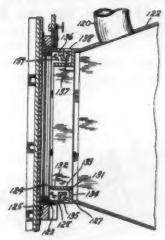
An electrostatic copier to feed sheet by sheet piled electrophotographic paper and transfer the image of the original sheet onto the paper, including a microswitch disposed at the entrance of an exposure station which is actuated and switches circuits for a charging device and a lamp when the electrophotographic paper charged on the switching on of a copying start switch enters the exposure station. A second microswitch disposed at the exit of the exposure station stops supplying electricity to the charging device, the lamp and two preset switches for copying a plurality of sheets when the tail end of the electrophotographic paper leaves an actuating member.

3,604,797
PHOTOELECTROSTATIC DUPLICATOR
Stanley J. Szczesniak, Lake Villa, Ill., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.
Filed Jan. 21, 1969, Ser. No. 792,616
Int. Cl. G03g *15/22*
U.S. Cl. 355—16 8 Claims



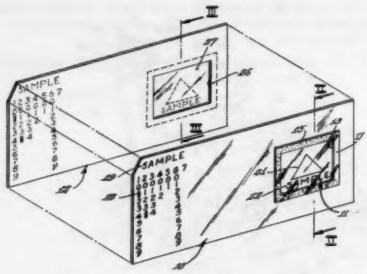
A photoelectrostatic duplicator equipped with a photoconductive belt mounted on a pair of drive rollers so that the belt moves in predetermined path about the rollers. The rollers are mounted in a pivotally mounted frame that is hinged at one end so that it can be swung into a vertical position when mounting or dismounting the belt. A locking device is part of the frame and it includes sliding bearings which are adapted to engage the main frame of the machine to lock the roller frame into its operating position. To unlock the roller frame the bearings are shifted axially clear of the main frame so that the rollers can be tilted on the hinge. One of the drive rollers has flange portions along its outer edges which keep the belt from "walking" off its course.

3,604,798
PHOTO-OFFSET PLATE MAKING MACHINE
Albert Gerson, Baldwin Rd., Yorktown Heights, N.Y.
Division of Ser. No. 537,464, Mar. 25, 1966, Pat. No. 3,484,166
Filed May 29, 1969, Ser. No. 862,094
Int. Cl. G03b *27/52*
U.S. Cl. 355—30 1 Claim



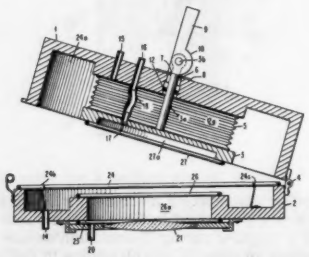
A photo-offset platemaking machine, including a negative carrier selectively positioned in fixed position upon a frame or base, and a negative carrier illumination device including a housing having an opening corresponding in size and shape to a planar surface on the negative carrier. The housing includes a source of illumination, and continuous light proof venting members periferally arranged on said housing adjacent said opening, whereby when the continuous edge defining the opening is placed in abutted relation with respect to the planar surface of the negative carrier, a light-tight seal is effected, and air is drawn through the ventilating members to form a cushion of air over the negative carrier to protect the negative from the heat of the illumination device. A cooling element exhausts the air from the hood at a point remote from the opening.

3,604,799
FILM RECORD CARD SYSTEM
Thomas P. Anderson, Hubbard Woods, Ill., assignor to Microseal Corporation, Skokie, Ill.
Filed Oct. 14, 1969, Ser. No. 866,306
Int. Cl. G03b 27/02
U.S. Cl. 355—79 3 Claims



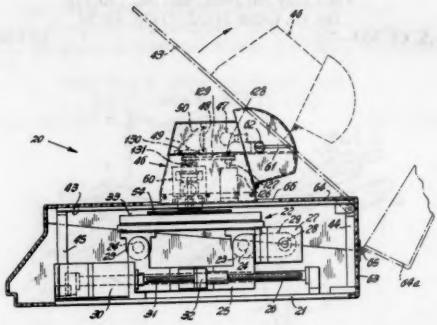
An information-storage system comprises a diazo-reproducible film-record card and a receptor or copying card treated with diazo compounds and carrying a strip of blank film also treated with diazo compounds. The reproducible film record card may be of the type adapted to be processed at high speeds by automatic tabulating or sorting machines and may comprise a sheet form card composed of transparentized paper stock having at least one cutout or aperture formed therein for receiving a strip of film containing a microimage and means for retaining the film within the cutout. The transparentized paper stock has an actinic transmission percentage enabling simultaneous diazo-reproduction of both data printed on the card and the microimage contained on the film. The receptor or copying card may include a card capable of being machine-processed in automatic sorting machines and has an aperture or cutout located coincidentally with the cutout of the reproducible card and mounts a film having a side or face surface thereof coated with diazo compounds and exposed.

3,604,800
HIGH RESOLUTION CONTACT PRINTING
Joseph G. Jordan, Poughkeepsie, and Robert C. Kammerzell, Hyde Park, both of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 23, 1969, Ser. No. 835,321
Int. Cl. G03b 27/20
U.S. Cl. 355—91 11 Claims



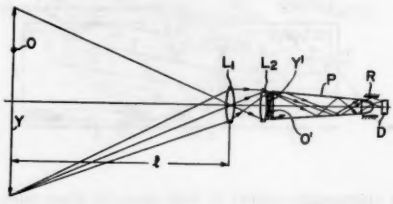
Finely detailed photograph images, e.g. microcircuit patterns, made by vacuum contact exposure have improved resolution of detail. A master plate containing a mask image and a sensitized object plate are manipulated from initial positions of separation into extremely close face-to-face contact. Entrapment of air between the plates, which prevents total contact, is avoided by exhausting the space containing the plates while the plates are held discretely separated and only thereafter manipulating the plates into total contact in the exhausted space.

3,604,801
FILM EXPOSING MACHINE FOR MAKING NEGATIVES
Joseph W. Young, New Preston, Conn., assignor to The Superior Electric Company, Bristol, Conn.
Filed June 11, 1968, Ser. No. 736,161
Int. Cl. G03b 27/04
U.S. Cl. 355—101 4 Claims



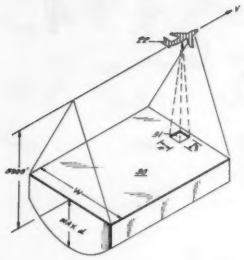
A machine that moves a light sensitive film with respect to a light beam along X and Y axes, in which the light beam is controlled as to shape and image on the film by means of an indexable wheel carrying differently shaped apertures with the aperture in alignment with the beam defining the shape of the image formed, and in which the beam impingement on the film is also controlled to permit movement without producing an image. The machine has especial utility in making printed circuit board film negatives as it is capable of automatic operation by a numerically controlled system using programmed commands.

3,604,802
WIDE ANGLE PHOTOELECTRIC POSITION DETECTING DEVICE UTILIZING A CONICAL TRUNCATED OPTICAL CONDENSER
Shigeru Ohmori; Yoshio Ishida, and Harumi Takeda, all of Tokyo, Japan, assignors to Tokyo Optical Company Limited, Tokyo, Japan
Filed Feb. 4, 1969, Ser. No. 796,412
Claims priority, application Japan, Mar. 7, 1968, 43/14,303
Int. Cl. G01b 11/26
U.S. Cl. 356—152 1 Claim



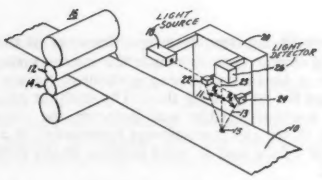
A wide angle photoelectric position detecting device having a truncated conical shape optical condenser interposed between an objective lens means with a widened field of view and a photoelectric transducer means. The position detecting device delivers energy from a light or heat source in the widened field of view onto a light receiving surface of said photoelectric transducer element without causing any divergence thereof.

3,604,803
OPTICAL DETECTION METHOD FOR SUBMERGED OBJECTS
Elliott H. Kahn, Brooklyn, N.Y., assignor to Kollsman Instrument Corporation, Elmhurst, N.Y.
Division of Ser. No. 345,674, Feb. 18, 1964, Pat. No. 3,446,555
Filed Mar. 3, 1969, Ser. No. 803,736
Int. Cl. G01c 3/08
U.S. Cl. 356—5 10 Claims



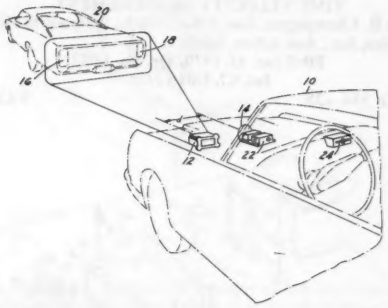
A submerged object indication system is carried from an aircraft flying above the water. A laser pulse generator directs a pulse at a small water area which may be 25 feet in diameter, and the receiver receives the air-water interface reflection which gates open a channel for receiving a submerged object reflection. A time delay is connected between an optical shutter and the detection circuit which receives the air-to-water interface reflection with the time delay related to the depth at which an object reflection is observed. The air-to-water interface signal can also be used to drive an altimeter with signals displayed visually on a cathode-ray tube display. The light source is in the blue-green portion of the spectrum, with the light pulse lengths being about 0.01 microseconds.

3,604,804
NONCONTACTING MOTION SENSOR
Carl M. Penney, Scotia, and Henry Hurwitz, Jr., Schenectady, both of, N.Y., assignors to General Electric Company
Filed Dec. 27, 1968, Ser. No. 787,519
Int. Cl. G01p 3/36
U.S. Cl. 356—28 7 Claims



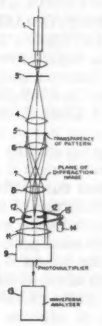
The motion of a moving surface is measured without making mechanical contact therewith by measurement of the difference between the Doppler shifts of different components of radiation scattered from a portion of the surface. In one specific embodiment of the invention, two coherent beams of light derived from a single laser are directed so as to be incident upon the same surface portion of a moving object from different directions, and light scattered from both of the incident beams by the surface is observed by a light detector. The detector yields a signal which oscillates at a frequency equal to the difference between the two Doppler shifts. This difference frequency is independent of scattering direction and is directly proportional to the component of the velocity of the illuminated surface in a direction determined solely by the orientation of the two incident beams.

3,604,805
OPTICAL DETECTING AND RANGING SYSTEM FOR AUTOMOTIVE VEHICLES
Gerald C. Scott, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed July 7, 1969, Ser. No. 839,346
Int. Cl. G01p 3/36
U.S. Cl. 356—28 8 Claims



A mechanical automatic gain control for a high-frequency detecting and ranging system of the short range type in which the axis of the transmitter is displaced relative to the axis of the receiver to linearize the strength of the received signal over the operating ranges of the system. The system may be used as a range or range rate finder in automotive vehicles in order to determine the distance or range and the range rate or relative velocity between a vehicle in which the system is located and the preceding vehicle. The transmitter transmits high-frequency electromagnetic energy, preferably in the infrared region, toward the rear of the preceding vehicle. This electromagnetic energy is reflected by the reflective lens systems found on the rear of conventional vehicles directionally back toward the transmitter. A small portion of this energy finds its way to the receiver which, as stated above, is displaced from the transmitter. It has been found that the strength or amplitude of the received signal does not vary inversely with the fourth power of the range, as is the case in conventional detecting and ranging systems, but may vary from values of 10 to 100.

3,604,806
PATTERN CLASSIFICATION APPARATUS
John David Redman, Newbury, England, assignor to United Kingdom Atomic Energy Authority, London, England
Filed Oct. 9, 1968, Ser. No. 766,185
Int. Cl. G06k 9/08
U.S. Cl. 356—71 2 Claims



The apparatus uses a beam of collimated light, e.g. from a laser, to produce a diffraction image of the pattern, e.g. a transparent fingerprint. This image is effectively scanned,

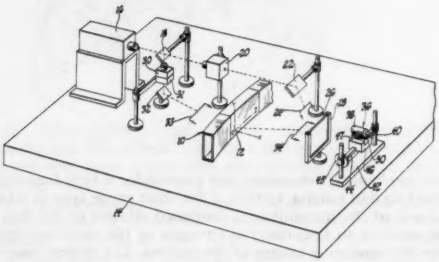
either mechanically by a light filter or filters which rotate relative to the image, in which case the transmitted light is converted to a cyclically varying electrical signal which can be frequency analyzed into components characteristic of the pattern, or statically by concentric arrays of photosensitive devices whose DC outputs are characteristic of the spatial frequencies of the pattern.

3,604,807

METHOD AND APPARATUS FOR HOLOGRAPHIC REAL TIME VELOCITY MEASUREMENT

Edwin B. Champagne, Ann Arbor, Mich., assignor to GCOptronics, Inc., Ann Arbor, Mich.

Filed Jan. 15, 1970, Ser. No. 3,083
Int. Cl. G01p *3/36*
U.S. Cl. 356—28 **9 Claims**



Method and apparatus are disclosed for measuring the velocity of a material using the techniques of holography in conjunction with measurement of a doppler shift frequency enabling the velocity at multiple points to be determined without the need for reestablishing an interferometric system. A hologram is made of a material in a static condition in a test zone. Motion of a test material in the zone is then initiated and the hologram is reilluminated in the same manner as in real time interferometry. A lens system images a point in the test zone onto a photocell and the light scattered from the focal volume is imaged in the photocell and additionally the wave front produced by the hologram is imaged in the photocell. Thus, two fields are superposed on the photocell and a mixing action takes place between one of the fields which is doppler shifted in frequency by the velocity and the other which retains the frequency of the reference beam. Thus the photocell produces an output signal equal to the doppler shift frequency which is proportional to a component of velocity in a known direction.

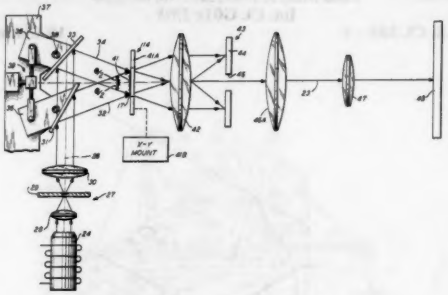
3,604,808

DETECTION OF CUMULATIVE REGISTRATION ERRORS ON PHOTOMASKS USING OPTICAL INTERFERENCE FRINGES

Laurence S. Watkins, Hightstown, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 31, 1969, Ser. No. 872,836
Int. Cl. G06k *9/08;* **G01b** *9/02*
U.S. Cl. 356—71 **6 Claims**

A fringe pattern generated by a pair of intersecting light beams of the same wavelength is employed in a spatial filtering technique to detect cumulative positional errors along a superposed linear test array of identical elements having a nominally fixed pitch between corresponding border edges, as in a row of repetitive images on an array-type photomask. The angle between the beams is adjusted so that the spatial period between points of equal intensity on the fringe pattern is an integral submultiple of the nominal spacing between corresponding edges of adjacent elements of the test array. The fringe pattern is spatially modulated by the test array and its diffraction pattern focused on a low-pass optical filter, which suppresses the spatial period of the fringe pattern. The light passed by the filter is reimaged to form a visual replica of the gross features (i.e., the edges) of the array elements, such edges having a cyclic variation of illumination because of the superposed portions of the fringe pattern. The period



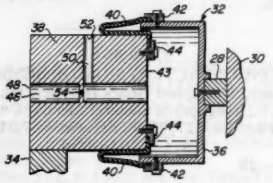
of the cyclic variation is inversely proportional to the magnitude of the cumulative positional error along the test array.

3,604,809

INTERFEROMETER-SPECTROMETER BRAKE

Herman De Weerd, Arlington, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed Mar. 6, 1969, Ser. No. 804,799
Int. Cl. G01b *9/02*
U.S. Cl. 356—106 **3 Claims**



An improved interferometer-spectrometer of the Michelson moving mirror type in which the mirror system is provided with a brake comprising a dashpot having two exit passageways for its working fluid. The dashpot also includes a rolling, everted flexible seal between the cylinder and piston, one of the exit passageways terminating in a port that is coverable by the seal at some position in the rolling travel of the seal.

3,604,810

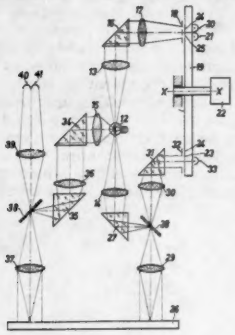
APPARATUS FOR THE OBJECTIVE LOCALIZATION OF AN OBJECT RELATIVE TO A SCALE CARRIER

Kurt Schuch, Jena, Germany, assignor to VEB Jenoptik Jena GmbH, Jena, Germany

Continuation-in-part of application Ser. No. 405,873, Oct. 22, 1964, now abandoned. This application June 14, 1968, Ser. No. 747,404
Int. Cl. G01b *11/26*
U.S. Cl. 356—139 **1 Claim**

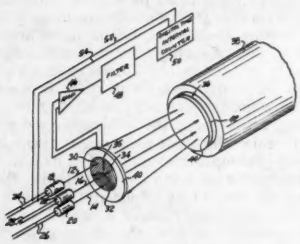
The positioning system of a machine tool comprises a coded multitrace scale which cooperates with a scanner provided with an interpolation system subdividing the intervals of the finest code trace. The scanner is provided with an opti-

cal element having a binary-coded scale effecting cyclical motion, and with pulse transmitters starting and terminating



the interpolation process. Photoelectric receivers scan the coded scale and the optical element.

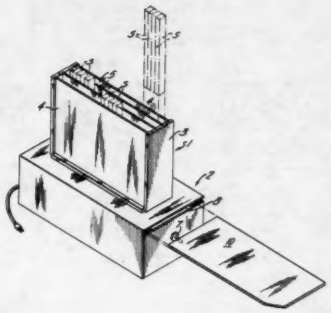
3,604,811
SHAFT POSITION ENCODERS
James M. McMenamin, Livonia, Mich., assignor to Teeg Research, Inc., Detroit, Mich.
Filed July 30, 1969, Ser. No. 846,213
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 **13 Claims**



An instrument capable of determining with precision the angular position of a shaft by projecting a plurality of beams of modulated polarized light through an analyzer rotating in unison with the shaft. The signal derived from the light passing through the analyzer is compared to the modulation input of one of the beams, with the resultant signal being representative of the shaft angular position.

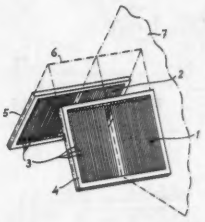
3,604,812
DEVICE FOR COMPARATIVE COLOR TESTING
Bernard Hugo Walsen, Ramsey, N.J., assignor to Dart Industries, Inc., Los Angeles, Calif.
Filed June 15, 1970, Ser. No. 46,060
Int. Cl. G01j *3/76*
U.S. Cl. 356—173 **8 Claims**

A device for visually comparing the inherent color of specimens of materials, such as transparent polystyrene, under substantially uniform conditions. The device comprises a specimen receiving means mounted to a base housing, said specimen receiving means having sidewalls defining at least one chamber having upper and lower end openings, the upper end opening being adapted to receive a test specimen into the chamber and the lower end opening communicating with the interior of the base housing, and known light source mounted in the base housing and adapted to direct light



waves through the lower end opening of the chamber and illuminate the test specimen received in the chamber.

3,604,813
POSITION-INDICATING INSTRUMENT
Gerrit Hendrik Te Kronnie, and Karel Hero Volkers, both of Van Breestraat 171, Amsterdam, Netherlands
Filed Nov. 25, 1969, Ser. No. 879,836
Claims priority, application Netherlands, Nov. 28, 1968, 6817007
Int. Cl. G01b *11/26*
U.S. Cl. 356—172 **12 Claims**

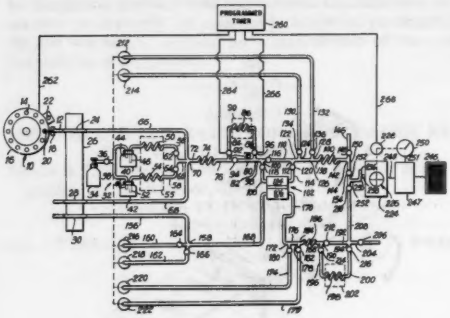


Moire instrument enabling a distant observer to locate a point into an optical plane of reference established by the instrument. The instrument has two line grids positioned in intersecting planes. For good visibility of the moire patterns certain specific conditions concerning the pitch of the grids and their separation have to be met. In order to maintain a sufficient working range, the pitch of the foremost grid may be made slightly larger than that of the rearmost grid.

3,604,814
METHOD AND APPARATUS FOR THE SEQUENTIAL ANALYSIS OF FLUID SAMPLES
Leonard T. Skeggs, Kirtland, Ohio, assignor to Technicon Corporation, Tarrytown, N.Y.
Filed June 20, 1969, Ser. No. 835,051
Int. Cl. G01j *3/46*
U.S. Cl. 356—181 **7 Claims**

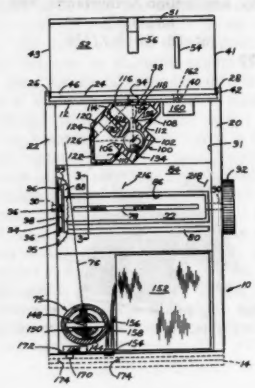
Method and apparatus are provided for the sequential analysis of a series of fluid samples with respect to different constituents thereof through the simultaneous flow of different sample portions through different flow paths for treatment thereof with respect to different ones of said con-

stituents and the subsequent, sequential flow of the thusly treated sample portions through the same analysis means for



the sequential analysis of said different sample portions with regard to different ones of said constituents.

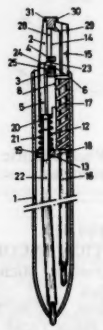
3,604,815
REFLECTANCE METER
Anton Hubert Clemens, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed Apr. 22, 1968, Ser. No. 723,102
Int. Cl. G01j *3/52, 3/46;* **G01n** *21/48*
U.S. Cl. 356—191 **4 Claims**



A small, portable photoelectric cell-type reflectance meter is described for use in measuring color reflectance values of analytical test devices. Since these analytical test devices have predetermined ranges of color reflectance values, the reflectance meter is preset to read color values within these ranges. The meter has a constant light output circuit, a regulated power supply based on battery power and a battery power check circuit.

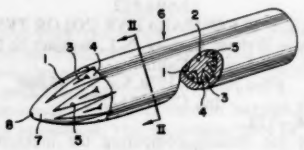
3,604,816
BALLPOINT PEN CONTAINING A NUMBER OF DIFFERENT COLORED CARTRIDGES
Francis Levoin, Lugano, Switzerland, assignor to Cado Etablissment, Vaduz Principality of Liechtenstein
Filed Mar. 20, 1970, Ser. No. 21,316
Claims priority, application Switzerland, Mar. 25, 1969, 4443/69
Int. Cl. B43k *27/00*
U.S. Cl. 401—31 **3 Claims**

A writing instrument, particularly a ballpoint pen containing a number of different colored writing cartridges, each of which is equipped with a pushbutton for advancing the associated cartridge while compressing its return spring. Each pushbutton extends out of the housing sleeve member of the ballpoint pen and both in its writing position as well as in its inoperable position bears against a mechanism which is locked by means of at least one projection in the ballpoint pen housing sleeve member, this projection being situated in an opening, the axis of which extends substantially perpendicular to the lengthwise axis of the ballpoint pen. According to important aspects of the invention, the lock mechanism is equipped at its lower end with an apertured plate member through which pass the writing cartridges and which serves as a support means for each return spring member provided for each writing cartridge. Furthermore, the above-mentioned mechanism includes web members which extend vertically from the apertured plate member and which are connected



with one another at their upper end, one such web member carrying the aforementioned projection. Additionally, these web members possess groove means for locking a pushbutton both in its writing position as well as in its inoperable position, the lower end of such groove means having two respective oppositely situated inclined surfaces. Each pushbutton is provided at its inner side with two projections which cooperate with the projections provided at the other pushbutton during actuation of the last-mentioned pushbutton in order to entrain the first-mentioned pushbutton. Additionally, each pushbutton is equipped at its lower end with a tail portion capable of being connected with the associated writing cartridge and at its upper end with two nose members, the upper and lower ends of which are inclined in order to lock such pushbutton when the nose members are located in the groove means and for unlocking such pushbutton when such nose members slide past the inclined surfaces.

3,604,817
WRITING INSTRUMENTS
Takaji Funahashi, No. 1, 2-chome, Kitatakasho-machi, Nishi-ku, Nagoya-shi, Aichi-ken, Japan
Filed Mar. 2, 1970, Ser. No. 15,693
Claims priority, application Japan, Mar. 3, 1969, 44/18963
Int. Cl. B43k *5/18*
U.S. Cl. 401—199 **4 Claims**



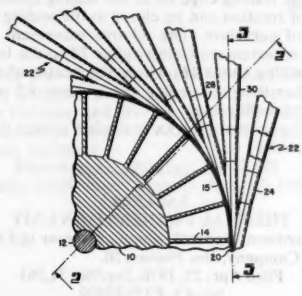
This invention provides writing instruments such as felt pens, marking pens or sign pens in which the construction is reinforced to strengthen the effect of writing instrument thereby increasing writing practice without causing deformation due to pressure applied to the pen point.

3,604,818

CENTRIFUGAL COMPRESSOR DIFFUSER

Val Cronstedt, Williamsport, Pa., and Gary M. Gron, Cincinnati, Ohio, assignors to Avco Corporation, Williamsport, Pa.

Filed Dec. 10, 1969, Ser. No. 883,819
Int. Cl. F04d 1/00, 17/08, 29/00
U.S. Cl. 415—207 6 Claims



The disclosure illustrates an annular diffuser assembly that receives gas discharged from a compressor impeller at supersonic velocity. The diffuser consists of a series of passages extending in a direction generally tangential to the impeller and spaced around the impeller so that their inlet ends intersect. The passageways each have a straight-sided polygon cross-sectional shape so that the diffuser passages have a series of generally V-shaped entrances. The diffuser passages may be formed with a particular cross-sectional shape to compensate for the variations in velocity of the airstream discharged from the impeller. The passageways may be formed from intersecting tubular elements or may be formed in opposing faces of a pair of sandwiched discs.

3,604,819

IMPELLER SHAFT ASSEMBLY

Francis J. Krahe, Frazier Township, Allegheny County, and Lawrence J. Serena, Washington Township, Westmoreland County, both of, Pa., assignors to United States Steel Corporation

Filed Oct. 14, 1969, Ser. No. 866,312
Int. Cl. B60b 27/06; F01d 5/04
U.S. Cl. 416—204 11 Claims

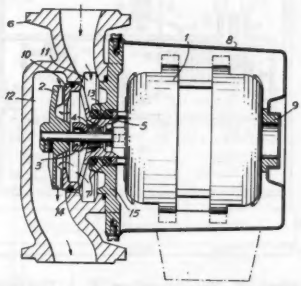
An impeller shaft assembly for a fan operating at high temperatures in the range from ambient temperature to a high-operating temperature is disclosed. The impeller shaft assembly has a metal shaft having at one end a connector portion of reduced nonround cross section. The reduced cross section has rounded corners. The shaft has a tapered portion provided with a taper toward the one end adjacent the connector portion. The shaft has a first coefficient of expansion. A ceramic impeller is disposed on the shaft and is provided with a connector aperture adapted to receive and frictionally engage the connector portion with a predetermined cold clearance. The impeller is provided with a tapered aperture adjacent the connector aperture, is adapted to receive the tapered portion with one cold clearance (of a cold clearance greater than the first predetermined cold clearance, a cold clearance equal to the first predetermined cold clearance and a cold clearance less than the first predetermined cold clearance) and defines an impeller shoulder with the connector aperture. The impeller shoulder is engageable with the shaft shoulder. The impeller has a second coefficient of expansion less than the first coefficient of expansion. Drive means are connected to the shaft to cause rotation of the shaft and the impeller at high speed. The shaft and the impeller are rotated by the drive means at the high speed and at the high temperature so that the predetermined cold clearance and the one cold clearance are reduced to a limit which approaches but never reaches zero.

3,604,820

MOTOR-DRIVEN PUMP

Winfrid Scheller, Luneburg; Harry Zimmermann, Tespe, and Gunther Boes, Luneburg, all of, Germany, assignors to Loewe Pumpenfabrik G.m.b.H., Luneburg, Germany

Filed June 20, 1969, Ser. No. 835,064
Claims priority, application Germany, June 22, 1968, P 17 63 554.0
Int. Cl. F04b 17/00; H02k 5/00
U.S. Cl. 417—363 4 Claims



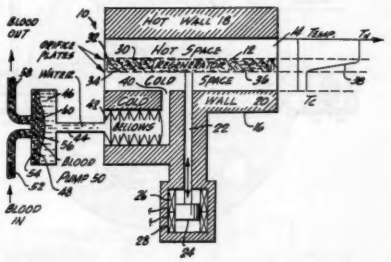
A power pump including a dry-operating drive motor mounted on the pump housing and connected to a pump impeller, wherein the output shaft includes a seal consisting of a slipring and a contrarotating ring which is coupled to an elastic noise damper on the pump housing.

3,604,821

STIRLING CYCLE AMPLIFYING MACHINE

William R. Martini, Richland, Wash., assignor to McDonnell Douglas Corporation

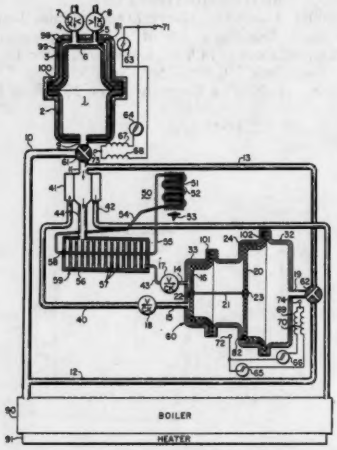
Division of Ser. No. 702,745, Feb. 2, 1968, Pat. No. 3,513,659
Filed Aug. 13, 1969, Ser. No. 870,930
Int. Cl. F04b 17/00, 43/06; F25j 3/02
U.S. Cl. 417—379 9 Claims



Constant volume regenerative, or Stirling, cycle thermal amplifying machine having an independently oscillated regenerator. Small amount of input energy is used to oscillate the regenerator. These oscillations produce large output pressure pulses which are adapted to drive a device, such as a pump, producing a large amount of output energy. Working fluid in machine is gas in one version wherein a bellows responsive to the pressure pulses of the gas is utilized to drive the pump, and is liquid in another version wherein the bel-

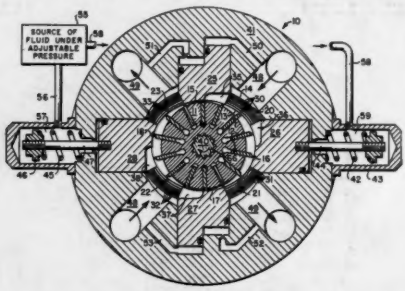
lows can be omitted and the pressure pulses of the liquid is directly utilized to drive the pump.

3,604,822
THERMAL COMPRESSOR
Herbert H. Saxe, Owings Mills, Md., assignor to The Bendix Corporation
Continuation-in-part of application Ser. No. 749,445, Aug. 1, 1968, now abandoned. This application Dec. 18, 1969, Ser. No. 886,167
Int. Cl. F04b *17/00;* **F03g** *7/06*
U.S. Cl. 417—339 **11 Claims**



The subject of this invention is a thermally actuated, vapor-driven diaphragm pump wherein condition sensor means and cascaded condenser/heat exchanger means are employed to maximize the cycle rate of the pump and to minimize the amount of driving energy dissipated, thereby producing a pump of high efficiency.

3,604,823
VANE TRACKING IN ROTARY DEVICES
David L. Thomas, Columbus, Ohio, assignor to The Battelle Development Corporation, Columbus, Ohio
Filed Mar. 2, 1970, Ser. No. 15,377
Int. Cl. F01c *21/16*
U.S. Cl. 418—26 **7 Claims**



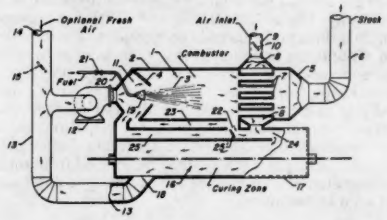
A two-lobe sliding-vane rotary moving-fluid device (FIG. 1) comprises a cylindrical rotor **11** having vanes **12** slidable in substantially radial directions therein, the tip of each vane maintaining substantial contact with the inner cylindrical surface **13** of a cam **14** surrounding the rotor as it traverses sealing spaces **15, 16, 17, 18,** and port spaces **20, 21, 22, 23** in the cam alternately during rotation.

The port spaces are formed largely of flexible laminations **30, 31, 32, 33;** so the cam is deformable by adjusting forces against its rigid portions **25, 26, 27, 28** to change its shape and thus to vary the fluid displacement by adjusting the relative positions of the rotor and the sealing spaces.

Throughout the range of displacement positions, any appreciable radial sliding of a vane is only inward as it traverses and maintains substantial contact with the inner surface of each sealing space. Such surface is substantially circular in cross section (FIG. **2**), and relative movement of the center of rotation **60** of the rotor is substantially along a portion of the radius **73** from the center of curvature **62** of the inner surface to the trailing edge **68** of the sealing space **15,** where the center of rotation can be closer to the sealing space than the center of curvature. The relative movement is substantially along an extension of the radius **74** to the leading edge **71** of the sealing space **16,** where the center of rotation **60** can be farther than the center of curvature **63** of the inner surface of the sealing space.

A fixed-displacement device is similar, except that the cam is not deformable.

3,604,824
THERMAL INCINERATION UNIT
Leslie C. Hardison, Norwalk, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Apr. 27, 1970, Ser. No. 31,961
Int. Cl. F23l *15/00*
U.S. Cl. 431—116 **10 Claims**



A thermal incinerator unit with an improved design that provides a gas recycle passageway means around and in combination with the combustion section to thereby limit the temperature increase through such combustion section and provide a controlled burning of the incinerated portion of the fumes. The recycle arrangement within the incineration unit is particularly applicable to the handling of a high B.t.u. content contaminated gas stream which could normally result in an excessive temperature rise across the combustion zone.

3,604,825
CANDLEHOLDER
Wasily M. Leshko, 402 Center St., Wiconisco, Pa.
Filed Oct. 9, 1969, Ser. No. 865,068
Int. Cl. F23d *3/16*
U.S. Cl. 431—290 **10 Claims**

A special-purpose wax candle holder, more particularly, a portable Troyca-type candelabra which is expressly but not

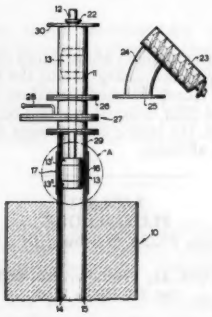
necessarily designed and acceptably adapted for ritualistic and ceremonial use in an all Eastern orthodox church and which is hand carried or held while the apostolic epistle and gospel is read and transfer of the holy eucharist is transferred from oblation to the main altar table. The three outer tubes, which enclose and shield the inner spring-loaded candle-holding tubes, provide the desired oriented branches and are coordinated with balanced and braced handling means.

ELECTRICAL

3,604,826
SHUTOFF DEVICE FOR HOLLOW ELECTRODES

Fritz Muller, Knapsack near Cologne; Hugo Werner, Hermulheim near Cologne, and Werner Nolden, Bruhl, all of, Germany, assignors to Knapsack Aktiengersellschaft, Knapsack bei Cologne, Germany

Filed Apr. 13, 1970, Ser. No. 27,571
Claims priority, application Germany, Apr. 17, 1969, P 19 19 523.4
Int. Cl. H05b *7/06*
U.S. Cl. 13—18 **12 Claims**

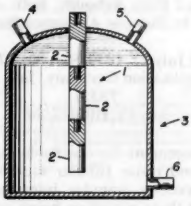


Shutoff device for hollow electrodes supplying particulate feed material to and/or supplying gas to or removing furnace gas from electrothermal reduction furnaces, arc melting furnaces, for example calcium carbide furnaces. A supply means mounted on the hollow electrode is formed with a thrust rod slidable therein, coaxially with respect to the electrode, and a stopper is detachably secured to the thrust rod which can be actuated from the outside and enables the stopper to be moved inside the supply means from a position permitting the free supply and removal of material through the electrode to a position inside the electrode where the supply and removal of material therethrough is arrested, and inversely. The shutoff device is more particularly formed with a solid stopper having at least one corrugated steel compensator associated to it for sealing the gap left between the stopper and electrode inside wall.

3,604,827
ELECTRODE FOR USE IN MANUFACTURING ELEMENTAL PHOSPHORUS

Milton P. Albert, and Milton J. Scott, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 19, 1969, Ser. No. 878,213
Int. Cl. H05b *7/06*
U.S. Cl. 13—18 **1 Claim**

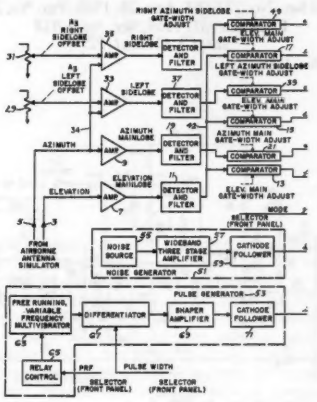


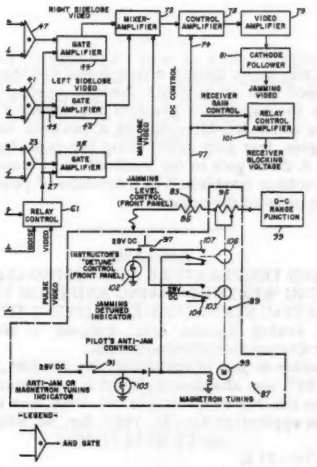
Improved amorphous carbon electrodes characterized by sonic propagation velocities of from 5,000 to 5,900 ft./sec. exhibit improved performance in electric furnace processes for manufacture of elemental phosphorus.

3,604,828
RADAR-JAMMING TECHNIQUE

Joseph F. Perkovich, Uniontown, Ohio, assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 27, 1965, Ser. No. 451,702
Int. Cl. G09b *9/00*; **G01s** *9/00*
U.S. Cl. 35—10.4 **8 Claims**





This invention relates to a radar simulator, and more particularly to a radar-jamming simulator.

In order to properly train radar operators in the techniques of operating their radar sets in battle conditions, it is necessary to provide them with training recognition of radar

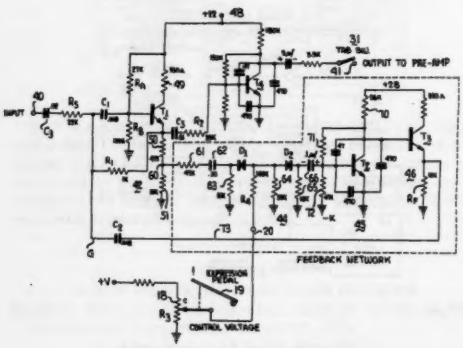
jamming, and the appropriate counter measure techniques to employ in the presence of jamming. To do this it is necessary, in the most preferred form, to provide jamming simulation equipment in association with an operational radar set. This jamming simulation equipment would include means to determine when the antenna of the radar is looking at an actual or simulated target which is to be interrogated or intercepted and to supply the desired simulated jamming effects. It is also necessary to display the simulated jamming signals on the operational radar scope or on a simulated radar scope, so that a radar operator may be able to learn how to apply proper defensive measures to minimize the effects of jamming on his radar scope. Various effects are simulated by such jamming simulation equipment including noise and pulse modulation forms of jamming. Additionally, in order to more realistically simulate jamming operating conditions, receiver blocking and magnetron tuning operations by the radar operator, are also simulated.

3,604,829

A DYNAMIC VOICING FILTER FOR AN ELECTRONIC ORGAN

David A. Bunger, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Division of Ser. No. 723,685, Apr. 28, 1968, Pat. No. 3,519,720
Filed Dec. 31, 1969, Ser. No. 1,918
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.19 **14 Claims**



An electric organ having conventional voicing circuits is also supplied with an auxiliary dynamic voicing filter, controlled by the expression pedal of the organ. The voicing filter is an active RC filter, having a feedback loop of controllable gain, that gain determining the peak frequency of the filter. A diode gate in the feedback loop is controlled by a control voltage established as a function of position of the expression pedal of the organ.

3,604,830

SPACE AND TEMPERATURE ACCOMMODATING SELF-CLEANING WEATHER CASING AND HIGH VOLTAGE INSULATING STRUCTURE EMPLOYING THE SAME

James H. Frakes, Tucson, Ariz., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 685,216, Nov. 22, 1967, now abandoned , which is a continuation of application Ser. No. 543,706, Apr. 19, 1966, now abandoned. This application Nov. 26, 1969, Ser. No. 880,332
Int. Cl. H01b *17/26*
U.S. Cl. 174—31 R **11 Claims**

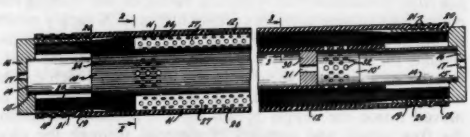
A weather casing has axially spaced sheds extending equal distances from the body portion of the casing, or sheds near one end thereof which extend from the body portion graduated increasing distances as the end is approached, to encase insulating bodies including bushings of tapering outside diameters as well as outside diameters uniform over the length to be covered, and enhance washoff of the lower sheds for either type bushing body. The casings are cemented or clamped at the ends. No gaskets are required. Oil may fill a substantial space between a casing composed of resilient or elastic material and the bushing body, the casing by its resiliency or elasticity accommodating expansion or contraction of the oil due to ambient temperature changes and other causes. The body of the casing and/or the sheds may be so flexible that wind moves the sheds, breaking ice and throwing off snow. Where a filler material is added between casing and body of insulation, the elastic casing keeps the filler material under pressure at all times.

3,604,831

FLUTED CORE

Daniel J. Goodman, 23236 Westbury Dr., St. Clair Shores, Mich.

Filed Oct. 21, 1969, Ser. No. 868,082
Int. Cl. H01b *7/34*
U.S. Cl. 174—15 **8 Claims**



A high-current-carrying, flexible electric cable has a central hollow core having longitudinal flutes along its exterior, conductors surrounding the core, and sheathing encasing the conductors. The core has an internal restriction adjacent to each end which permits limited flow of liquid through its hollow interior and has a perforated portion adjacent thereto toward each end of the conductor in order that liquid introduced into the core will be forced through the perforations into the interstices between the conductors and a limited portion passes through the interior of the core.

3,604,832

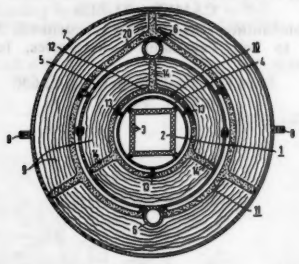
COAXIAL ARRANGEMENT OF TUBULAR MEMBERS, AND SPACER STRUCTURE FOR SUCH ARRANGEMENTS

Hubert Kohler, and Fritz Schmidt, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed July 22, 1970, Ser. No. 57,085
Claims priority, application Germany, July 25, 1969, P 19 37 795.8
Int. Cl. H01b *7/34*
U.S. Cl. 174—15 **10 Claims**

A coaxial arrangement for coolable cables or the like, comprises inner and outer tubular members which form a longitudinally extending, annular interspace between each other, one or both these members being contactable by coolant passing through the cable during operation. The annular interspace is secured by longitudinally spaced spacer struc-

tures of poor heat-conducting material. Each of the spacer structures is in contact with the respective tubular members at only small areas and has a ring portion surrounding the inner tubular member when in assembled condition. The ring-shaped portion has inwardly directed and angularly spaced bosses or little protrusions which face and contact the inner tubular member when the arrangement is in assembled



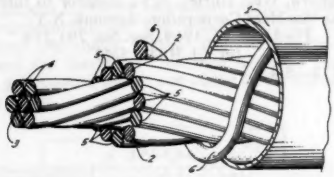
condition. Three spoke members are joined with and protrude in a radially outward direction from the ring portion so as to engage the outer tubular member of the arrangement when assembled. The three spoke members are 120° peripherally spaced from each other. Each spacer structure is composed of a plurality, preferably three component members, each component member carrying one of the three spoke members.

3,604,833

CONSTRUCTION FOR CRYOGENIC CABLES

August Beck, Langenhagen, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Nov. 28, 1969, Ser. No. 880,995
Claims priority, application Germany, Dec. 4, 1968, P 18 12 613.1
Int. Cl. H01b *7/34*
U.S. Cl. 174—15 **14 Claims**



Superconductive strings are stranded with insulating strings to form a rope which is inserted in a pipe otherwise filled with or passed through by coolant to obtain cryogenic conditions.

3,604,834

DOOR FOR A SHIELDED ENCLOSURE

Roger C. Follett, Carson, Calif., assignor to Sprague Electric Company, North Adams, Mass.

Filed Aug. 12, 1969, Ser. No. 849,400
Int. Cl. H05k *9/00*
U.S. Cl. 174—35 MS **4 Claims**

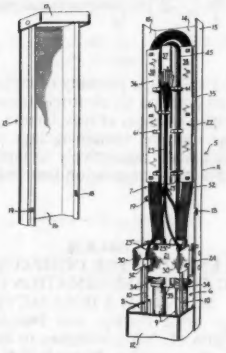
A sliding door for a shielded enclosure is constructed with a pair of spaced panels and includes an expandable means, typically a bladder, which is disposed between the panels and is adapted to create a uniform sealing pressure of each panel against the door frame.

3,604,835

TERMINAL ENCLOSURE FOR BURIED CABLE PLANT

Douglas L. P. Hamilton, 3111 West Mill Road, Milwaukee, Wis.

Filed Apr. 22, 1970, Ser. No. 30,669
Int. Cl. H02g *9/02*
U.S. Cl. 174—38 **11 Claims**



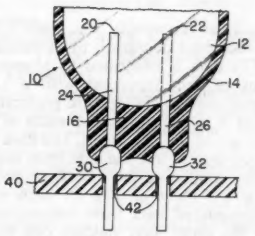
A terminal chamber in the top part of a terminal enclosure for a buried cable installation is compartmented by platelike supporting and partition members, both carried by a channel-shaped rear member comprising the main enclosure body. Both compartmenting members are in forwardly spaced generally parallel relation to the rear member web. The supporting member, near the bottom of the terminal chamber supports upright stretches of cable and service lines. The partition member, spaced above it, has spliced conductors and an unassigned conductor loop secured to and overlying its front face, while a loop of unassigned conductors lies behind it.

3,604,836

DIP-COATED ELECTRICAL COMPONENTS

Ralph E. Pierpont, Kennebunk, Maine, assignor to Sprague Electric Company, North Adams, Mass.

Filed Sept. 8, 1969, Ser. No. 855,897
Int. Cl. H05h *5/00*
U.S. Cl. 174—52 PE **3 Claims**

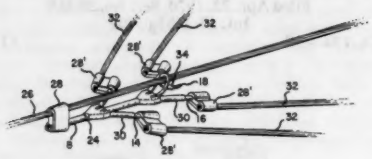


Solder globules applied to lead wires for dipped electrical components act as reference points and barriers in dipping, and as standoffs and soldering assists for circuit board mounting.

3,604,837
UTILITY MIDSPAN ADAPTER

James L. Mixon, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 3, 1970, Ser. 60,676
Int. Cl. H02g 7/00
U.S. Cl. 174—72 R 6 Claims

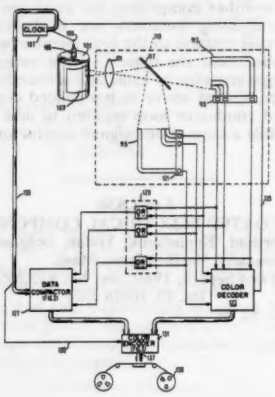


An adapter for splicing a plurality of taplines and a streetlight to a selected point on an electrical transmission line and including a stamped plurality of legs. One leg is spliced to the transmission line and the remaining legs project from the adapter and are spliced respectively to taplines. One of the legs is anchored to the transmission line and provided with a streetlight.

3,604,838
COLOR ENCODER FOR COMPACTING AND RECORDING COLOR INFORMATION OBTAINED BY SCANNING A DOCUMENT

John V. Sharp, West Hurley, and Donald R. Thompson, Woodstock, both of, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 11, 1969, Ser. No. 815,444
Int. Cl. H04n 1/46
U.S. Cl. 178—5.2 R 6 Claims

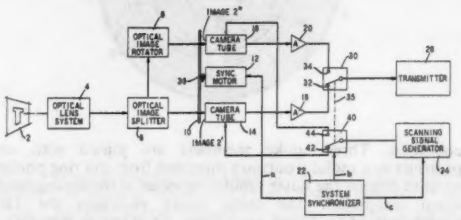


A color encoder compacts the data obtained from scanning a multicolored document by eliminating redundant information. The data is generated by scanning small contiguous regions of the document with a color-detecting system. The small regions scanned are preferably square and have sides equal in length to half the width of the narrowest line which appears on the document. The data compaction is performed in two steps. First, the data from the scan of a line is compacted by combining the data from pairs of adjacent regions to form one piece of data for each pair of regions. Second, the compacted data from successive scan lines is compacted in the same way, yielding one line of data for each pair of lines. This compaction reduces the data from four regions of one piece of data. The scanned document is specially prepared and has a background color with predetermined characteristics suitable for use with the color detector which determines the color of each region. The color encoder determines and records which is the first region in a group of regions to have a nonbackground color, the color of that region and whether any subsequent region in the group of regions has a different nonbackground color.

3,604,839
FIELD-SEQUENTIAL COLOR TELEVISION APPARATUS EMPLOYING COLOR FILTER WHEEL AND TWO CAMERA TUBES

Sotirios Constantine Kitsopoulos, Waedenswil, Switzerland, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 19, 1970, Ser. No. 12,630
Int. Cl. H04n 9/34
U.S. Cl. 178—5.4 CF 11 Claims

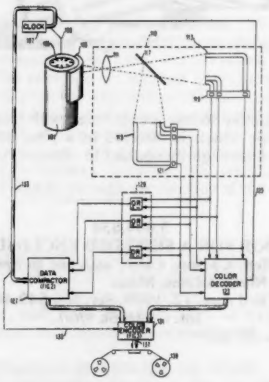


In a three-color, field-sequential television system, color crosstalk is reduced and signal-to-noise ratio increased by using two monochrome television camera tubes in optical correspondence with a three-color filter wheel. The physical relationship of the camera tubes and the filter wheel allows the tubes to be scanned in alternate time periods, thereby extending exposure time relative to scanning time. The video signals from the two tubes are combined to produce a three-color, field-sequential television signal.

3,604,840
COLOR ENCODER

John V. Sharp, West Hurley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,274
Int. Cl. H04m 5/42
U.S. Cl. 178—5.4 R 7 Claims



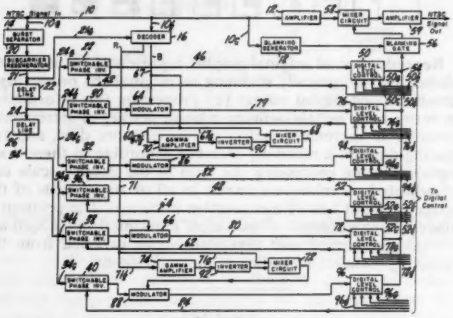
A color encoder for encoding the colors detected in scanning a document which detects the first region among a contiguous set of regions of equal area containing a color other than background color. If any other regions contain a color other than said first region (not including background), this is also detected. It records which regions contain a color and which regions contain background, the color of the first

region which contains a color, and whether any of the other regions contains a different color.

3,604,841
CORRECTION APPARATUS FOR ENCODED COLOR TELEVISION SIGNALS

Adrian B. Ettlinger, Hastings-on-Hudson, N.Y., and Renville H. McMann, Jr., New Canaan, Conn., assignors to Columbia Broadcasting System, Inc., New York, N.Y.

Filed May 1, 1969, Ser. No. 820,790
Int. Cl. H04n *1/00*
U.S. Cl. 178—5.4 R **4 Claims**

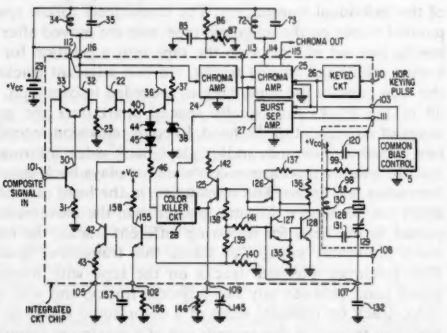


In one embodiment of the invention described herein, synchronous blue and red color carrier correction signals of proper phase are developed from an encoded color television signal. The carrier signals have introduced therein fixed increments of correction to produce thereby blue and red black level correction signals. The signals are also supplied to a set of modulator circuits wherein the signals are modulated by decoded blue and red color component signals. The resulting gain control signals, which have amplitudes proportional to the instantaneous amplitudes of the decoded signals, are also corrected in increments. Furthermore, the signals are supplied to another set of modulator circuits wherein the signals are modulated by signals comprising the differences between gamma corrected and linear decoded blue and red color component signals. The resulting gamma correction signals have introduced therein fixed increments of correction and are thereafter combined with the color black level and gain control signals and added to the encoded color television signal.

3,604,842
AUTOMATIC CHROMA CONTROL CIRCUITS

Leopold Albert Harwood, Somerville, N.J., assignor to RCA Corporation

Filed May 8, 1969, Ser. No. 822,951
Int. Cl. H04n *9/48*
U.S. Cl. 178—5.4 AC **10 Claims**

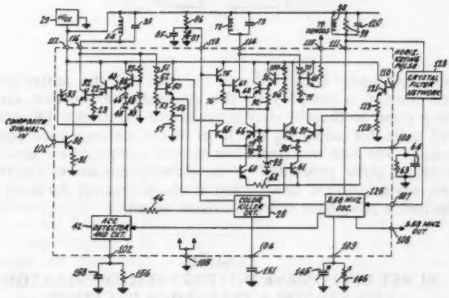


Automatic chroma control circuitry employs a peak detector circuit, operated from a chroma oscillator configuration, which oscillator exhibits a varying amplitude response determined by a narrow band filter included in an AC feedback path for the oscillator and arranged to selectively filter signal frequencies within the narrow band-pass as coupled thereto during the oscillatory burst interval. The band-pass filtered signals, including noise components serving to vary the peak amplitude of the oscillator cause the detector to provide at an output a control voltage proportional to the highest peak of the oscillator. This control voltage is applied to a chroma amplifier stage for varying the gain in accordance with varying oscillator amplitude.

3,604,843
AMPLIFIER CIRCUITS

Leopold Albert Harwood, Somerville, and Erwin Johann Wittmann, N. Plainfield, both of, N.J., assignors to RCA Corporation

Filed May 8, 1969, Ser. No. 822,887
Int. Cl. H04n *9/12*
U.S. Cl. 178—5.4 R **10 Claims**



An amplifier comprises first and second transistors. A voltage divider is coupled between the base electrode of the first transistor and a point of reference potential. The base electrode of the second transistor is also coupled to an intermediate point on the voltage divider. A degenerating resistor coupled between the emitters is selected to provide a DC voltage drop thereacross equal to the DC drop between the base electrodes. A common current return path coupled to the emitter of the second transistor biases both transistors linearly with said voltage divider while the degenerating resistor also serves as a negative feedback element for signals applied to the base electrode of the first transistor.

The bias scheme enables both transistors to operate linearly, as stably biased, while exhibiting different gain factors for signals applied to their respective base electrodes.

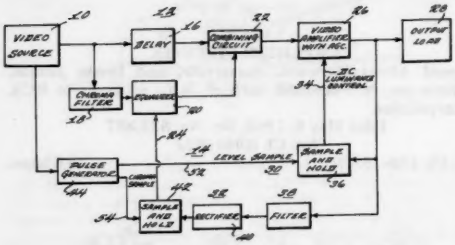
3,604,844
VIDEO SIGNAL PROCESSING AMPLIFIER WITH AUTOMATIC GAIN CONTROL

John D. Ross, Dollard des Ormeaux, Quebec, Canada, assignor to Central Dynamics, Ltd., Pointe Claire, Montreal, Quebec, Canada

Filed May 28, 1969, Ser. No. 828,538
Int. Cl. H04n *9/48*
U.S. Cl. 178—5.4 AC **11 Claims**

Automatic gain control circuitry is disclosed for maintaining the chrominance and luminance levels of a composite color television signal at a constant value. First and second test signals are respectively inserted in the 17th and 18th lines of the vertical blanking interval of each television field. The first test signal is typically a 100 IRE unit white pulse while the second is a high frequency burst signal, the frequency of which may correspond to that of the color burst. In order to maintain the level of the chrominance component of the composite color signal at a constant value, the composite color signal is applied to a signal amplifying channel where the chrominance component is extracted and the amplitude thereof is adjusted by a DC control signal which is

derived as follows: The composite color signal is also applied to a pulse generator which produces a first sampling pulse during the 18th line of the vertical blanking interval so as to coincide with the approximate center of the second test signal, this sampling pulse being applied to a first sample and hold circuit. After the chrominance level has been adjusted, the adjusted composite color signal is also applied to the first sample and hold circuit. In particular, the high frequency



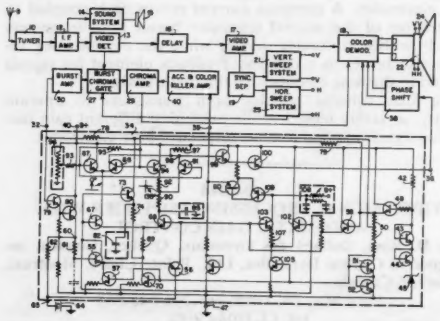
burst test signal is filtered and rectified and the center portion thereof is sampled by the above-mentioned first sampling pulse to thereby derive the above-mentioned DC control pulse for adjusting the level of the chrominance component. The first test signal has its level sampled by a second sampling pulse generated by the pulse generator to thereby derive a second DC control signal which controls the level of the entire composite color television signal.

3,604,845

BURST-RESPONSIVE DIFFERENTIAL OSCILLATOR CIRCUIT FOR A TELEVISION RECEIVER

Gildo Cecchin, Niles, and Francis H. Hilbert, River Grove, both of, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Nov. 26, 1969, Ser. No. 880,320
Int. Cl. H04n *9/48*
U.S. Cl. 178—5.4 AC **6 Claims**



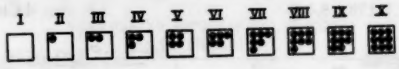
A color television receiver uses an integrated circuit to provide the subcarrier reference signals and ACC control voltage for the receiver. The circuit includes a first differential amplifier, unbalanced at the burst signal frequency, operated as the color reference oscillator to provide first and second differently phased output signals which are applied to a pair of differential steering gates. A phase-shift hue control of the color reference signal is obtained by adding selected outputs of the pair of differential steering gates. In addition, a differential amplifier is operated as diodeless detector for deriving ACC voltage from the oscillator output when burst signals are applied to the input of the oscillator.

3,604,846

METHOD AND SYSTEM FOR RECONSTRUCTION OF HALF-TONE IMAGES

David Behane, Yellow Springs; Lewis H. Spradley, Centerville; Lysle D. Cahill, Dayton, and William M. Marshall, Dayton, all of, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 3, 1969, Ser. No. 803,910
Int. Cl. H04n *1/04, 1/28, 1/40*
U.S. Cl. 178—6.6 R **12 Claims**



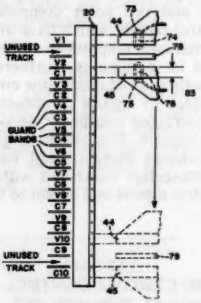
Reproduction of original graphic representations is accomplished by (a) optically scanning an original (b) producing a density scaled digital output (c) processing this information to derive code signals defining relative density of incremental areas as an increment matrix of one or more dots, and (d) placing dots on a receiving member according to these code signals. During processing the span of the density scale can be adjusted to enhance contrast in all or some areas of the image, without loss of mensuration accuracy. The printout is made through control of individual marking drops which are selectively charged and deposited on or diverted from the receiving member according to the code signals.

3,604,847

MULTITRACK MAGNETIC RECORDING SYSTEM

Kingston E. Ganske, Columbus, Ind., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Feb. 14, 1968, Ser. No. 705,479
Int. Cl. G11b *3/36, 21/08, 23/18*
U.S. Cl. 178—6.6 A **10 Claims**



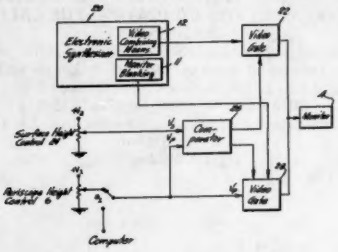
A magnetic recording head has at least two magnetic transducers constructed in a common head in spaced-apart relation sufficient for convenient assembly and proper shielding of the individual transducers. The transducers follow spaced parallel tracks on the magnetic tape, and are moved after following one set of tracks on the tape into a position for following additional spaced tracks. No two adjacent tracks on the tape contain the same type of recorded information, and all of the tracks are equally spaced apart over the entire range of movement of the head. In color television recording, one transducer records and/or plays back video information and the other transducer records and/or plays back color information and audio. The transducers in the head are spaced apart (on centers) a distance greater than the movement imparted to the head for following different tracks, the movement preferably being two thirds this transducer spacing. This produces alternate tracks on the tape with minimum guard band between any two adjacent tracks, and with each video track on opposite sides of a color-audio track. In longitudinal recording this permits use of a maximum amount of the tape surface, leaving only two possible track areas unused.

3,604,848

PERISCOPE BREAKWATER SYNTHESIZER

Carl R. Driskell, Winter Park, Fla.

Filed Apr. 27, 1970, Ser. No. 31,953
Int. Cl. H04n 7/18
U.S. Cl. 178—6.8 5 Claims



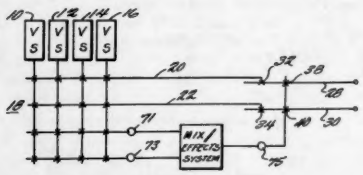
Electronic means for automatically changing the illumination of the view observed through the periscope of a submarine periscope view simulator training device as the simulated depth of the periscope is changed. As an ascending periscope approaches the surface of the sea from below, the illumination of the periscope view increases at a rate related to the rate of ascent from darkness to a higher value at a position just below the surface. As the periscope breaks through the surface, full illumination is provided and the scene at the surface becomes visible. A reverse sequence is followed when a periscope descent is made. The invention provides means for simulating the changes in illumination observable in a periscope during the simulation of both ascents and descents.

3,604,849

MIX-EFFECTS SYSTEM FOR TELEVISION VIDEO SIGNALS

Ole Skrydstrup, Pierrefonds, Quebec, Canada, assignor to Central Dynamics, Ltd., Montreal, Quebec, Canada

Filed May 28, 1969, Ser. No. 828,536
Int. Cl. H04n 5/24
U.S. Cl. 178—6.8 19 Claims



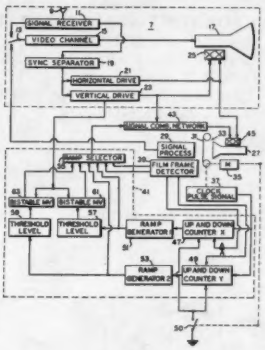
A mix/effects system for television video signals is disclosed, the system including a plurality of video sources, a matrix of switching cross points, the input buses of which are respectively connected to said plurality of video sources and the output buses of which are connected to appropriate destination points. Switching circuitry having two input terminals is connected to no more than two of the output buses from said matrix of switching cross points. The switching circuitry also includes two output terminals, the switching circuitry comprising a plurality of switching elements. A mixing amplifier having two input terminals is connected to the two output terminals of the switching circuitry. Circuitry for generating control signals for controlling the energization of the switching elements enables the switching circuit together with the mixing amplifier to provide a wide variety of video signal effects at the output terminal of the mixing amplifier.

3,604,850

VARIABLE SPEED CONTINUOUS MOTION FILM AND TELEVISION SCAN SYNCHRONIZATION

Robert Roy Eckenbrecht, East Bethany; Charles Bailey Neal, Batavia, and Dong Woo Rhee, Williamsville, all of, N.Y., assignors to Sylvania Electric Products, Inc.

Filed Apr. 15, 1970, Ser. No. 28,864
Int. Cl. H04n 5/36
U.S. Cl. 178—7.2 D 26 Claims



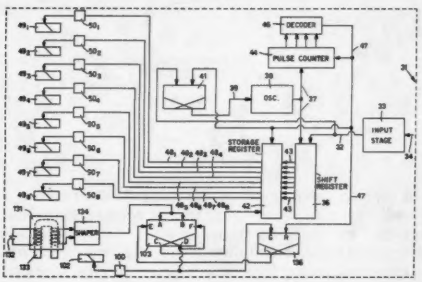
A system is provided for deriving images from a film of film frames, either motionless or continuously and bidirectionally movable at different speeds, and effecting translation between the different film frame speeds and the scanning frequency of a display device whereon the derived images are displayed. A flying spot scanner system is employed wherein a film of film frames is continuously advanced through a film scanning zone, the film frames are detected to provide a pair of vertical scan modification signals, a selector means switches from one to the other of the modification signals in accordance with the positional location of the film frames within the film scanning zone and the retrace period of the vertical scanning signals, and the vertical scan and vertical scan modification signals are combined and applied to the flying spot scanner system to vertically modulate electron beam scanning in accordance with film movement.

3,604,851

RECEIVING DEVICE FOR CODE COMBINATIONS FOR A TELEPRINTER OF THE START-STOP TYPE

Bruno Sandrone, and Giuseppe Ricciardi, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Torino, Italy

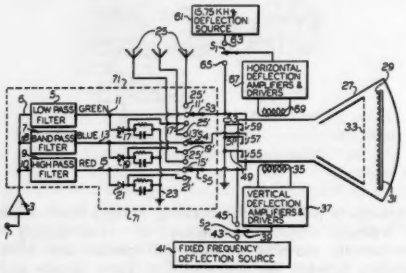
Filed June 12, 1969, Ser. No. 832,616
Claims priority, application Italy, June 12, 1968, 52014-A/68
Int. Cl. H04l 15/24
U.S. Cl. 178—36 11 Claims



A receiving device for a start-stop teleprinter comprises a shifting register adapted to serially receive a code combina-

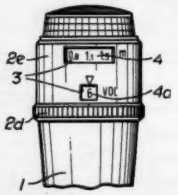
tion and to transfer in parallel the received combination to a temporary storing register for simultaneously controlling a set of code electromagnets. A start electromagnet adapted to cause a printing mechanism to be cyclically operated is controlled by a bistable control circuit, which is set by a character ready signal generated upon receiving the code combination. The circuit then clears the storing register and is reset by a signal generated upon sensing at least one element movable with said mechanism.

3,604,852
APPARATUS FOR THE VISUAL AESTHETIC DISPLAY OF SOUND
Joseph B. Weintraub, New York, N.Y., assignor to Howard Wise, New York, N.Y., a part interest
Filed Mar. 2, 1970, Ser. No. 15,440
Int. Cl. G10l *1/14*
U.S. Cl. 179—1 VS **6 Claims**



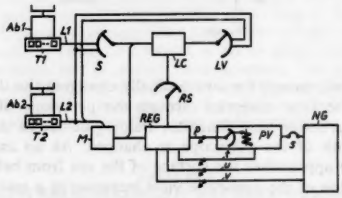
An apparatus for visually displaying aesthetic configurations representative of sound including multicolor kinescope displays in which the degree of sharp curvatures or discontinuities in the configurations being viewed on the kinescope display is substantially reduced by jointly varying beam intensity and beam deflection as a function of sound spectral content.

3,604,853
ADJUSTMENT-FACILITATING DEVICE FOR USE WITH A MICROPHONE AND VOLUME CONTROLLER
Ernst Pless, Vienna, Austria, assignor to Akustische V. Kino-Geraete Gesellschaft m.b.H., Vienna, Austria
Filed Nov. 20, 1967, Ser. No. 684,354
Claims priority, application Austria, Nov. 29, 1966, A11034/66
Int. Cl. G06c *3/00*
U.S. Cl. 179—1 A **5 Claims**



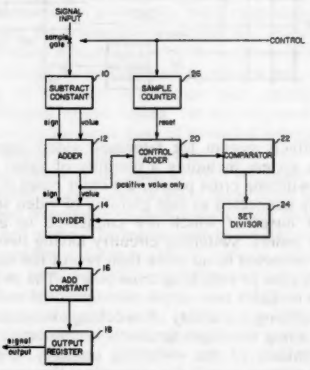
A device for facilitating correlation between the values, sound source distance, sound source volume and gain control setting, of an electroacoustical system including a microphone and an amplifier having a gain control, when two of these values are known, comprises a scale support carrying, in mutually fixed coordination, a first scale representative of the setting of the gain control, and at least one other scale representative of the distance of the sound source from the microphone. A slide on the support is movable along the scales and has a first indicator cooperable with the first scale and second indicator elements cooperable simultaneously with at least three adjacent indicia of each other scale. The device may comprise a unit physically independent of the microphone and the gain control, incorporated with the microphone, or incorporated with the gain control.

3,604,854
ARRANGEMENT AT A CALLED SUBSCRIBER'S INSTRUMENT FOR INDICATING THE CALLING INSTRUMENT
Anton Christian Jacobaeus, Stockholm, and John Carl Harold Bjork, Trangsund, both of, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Nov. 10, 1969, Ser. No. 875,475
Claims priority, application Sweden, Dec. 13, 1968, 17113/1968
Int. Cl. H04m *15/06*
U.S. Cl. 179—5.5 **1 Claim**



In an automatic telephone exchange certain subscribers can use short numbers instead of the directory numbers for calls to optionally selected extensions which often are called from the subscriber. The invention has for a purpose to indicate at the called subscriber's instrument who is calling or has called with the use of a short number. A registering means for short numbers is arranged at the subscriber's instrument. In the exchange identifying means and analyzer are arranged so that on one hand the identity of the called extension corresponding to a short number is indicated for connecting a telephone communication, on the other hand the short number of the calling subscriber valid at the called part is indicated for setting the registering means of the called subscriber's instrument.

3,604,855
DIGITAL CONFERENCE CIRCUIT FOR PCM SIGNALLING SYSTEM
Uwe A. Pommerening, Webster, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.
Filed Jan. 2, 1970, Ser. No. 98
Int. Cl. H04m *3/56*
U.S. Cl. 179—18 BC **4 Claims**



Signals from all conference channels are added in digital (binary) form and the sum is fed through a divider to an out-

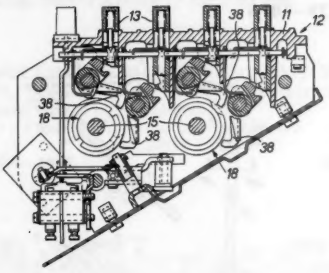
put register for distribution to all participating channels. The divider is set in response to a comparison between sums taken over predetermined successive intervals (about one-quarter second) and the maximum capacity of any one channel. The comparison made for each interval determines the divisor for the next interval.

3,604,856

AUTOMATIC DIALING SYSTEM FOR TELEPHONES

Gavin Patrick Blandy Martin, Alcester, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed May 26, 1969, Ser. No. 828,455
Int. Cl. H04m *1/26*
U.S. Cl. 179—90 B **8 Claims**



An automatic dialing system for telephones having a plurality of rotatable memory units each of which contains a telephone address, selection means for selecting one of the plurality of memory units, and a dialing switch mechanism which is rotatable to dial digits, and which is urged towards its rest position by a return spring. The memory units and the dialing switch mechanism are connected to respective first and second outputs of a differential gear mechanism the input of which is driven by an electric motor, and a pawl assembly is associated with the memory units and is operable to prevent rotation of the memory units. A first cam is rotatable with the input of the gear mechanism, and a second cam is rotatable with the first output of the gear mechanism. A cam follower is urged into engagement with the first cam, and is engageable by the second cam, movement of the cam follower operating a switch to control energization of the electric motor driving the input of the gear mechanism. The first cam is provided with a depression which is engageable by the cam follower to break the electric motor circuit and the second cam has a lobe which is engageable with the cam follower to move the cam follower to complete the motor circuit. The cam follower is moved out of engagement with the depression in the first cam to energize the motor, whereafter the cam follower rides on the periphery of the first cam as the first cam rotates, the first cam being rotated through one complete revolution to perform a dialing cycle to dial a single digit. The first and second cams are displaced angularly when a digit is dialed so that at the end of a dialing cycle the motor is deenergized with the lobe of the second cam displaced angularly from the depression in the first cam, and the second cam then being rotated by return movement of the dialing switch mechanism so that subsequently the lobe lifts the cam follower to restart the motor whereafter a further dialing cycle is performed. The dialing system is stopped after the full address has been dialed by performing a cycle at the end of the address in which no digit is dialed, so that the cam follower engages the depression in the first cam fractionally after the lobe of the second cam has past the cam follower.

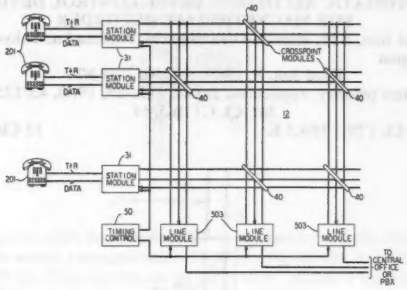
3,604,857

LINE-ORIENTED KEY TELEPHONE SYSTEM

David C. Opferman, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed July 25, 1969, Ser. No. 844,913
Int. Cl. H04n *1/00*
U.S. Cl. 179—99 **9 Claims**

A key telephone system is disclosed in which only one pair of speech leads extends to the station set regardless of the number of lines connectable to that station set. Data is transferred between the station set and a station module for each set. A line module is further provided for each line from the central office or PBX coming into the key telephone system and a line is assigned or made available to a station set by the inclusion of a cross-point module in a cross-point array. As each line module is enabled in sequence, it first transmits line



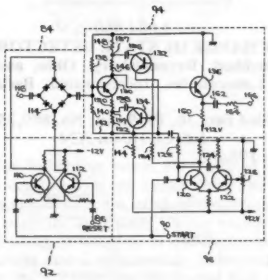
control information to all the station modules connected thereto and then receives station set control information from all the station modules connected thereto. Station set information is stored in the station module for all lines available to that station set and then transmitted to the station set after all line modules have been enabled in one cycle of operation.

3,604,858

SIGNAL EDITING SYSTEM FOR HIGH FREQUENCY SIGNAL MAGNETIC RECORDING AND REPRODUCING APPARATUS

Toshio Doi, Hamatmatsu, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed May 7, 1969, Ser. No. 822,620
Claims priority, application Japan, May 9, 1968, 43/30,518
Int. Cl. G11b *27/08;* **H04n** *5/78*
U.S. Cl. 179—100.2 B **7 Claims**



The invention provides a signal editing system for magnetic recording and reproducing apparatus which record on magnetic tape or other storage medium. The recorded signal includes a carrier wave which is frequency-modulated by video signals or other wide-band signals. This signal editing system is useful in recording a second signal on the magnetic medium on which a first signal is already recorded. The second signal is recorded on the magnetic track of the first signal on the magnetic medium, beginning at a suitable point on the magnetic track. The carrier wave components and the upper side band components of the second frequency-modulated signal are recorded at a predetermined higher than normal signal level only during the period the two signals are recorded, one superimposed over the other. The lower side band components of the second frequency-modulated signal

are recorded at a signal level which is gradually lowered from said predetermined level with lowering of frequencies.

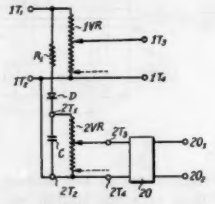
The system markedly reduces distracting editing marks which generally occur as a result of superimposed recording of two signals. It also reproduces recorded video signals at a high fidelity.

3,604,859

AUTOMATIC RECORDING LEVEL CONTROL DEVICE FOR MAGNETIC TAPE RECORDER

Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan

Filed Jan. 8, 1969, Ser. No. 789,877
Claims priority, application Japan, Feb. 29, 1968, 43/12573
Int. Cl. G11b *5/44*
U.S. Cl. 179—100.2 K **13 Claims**



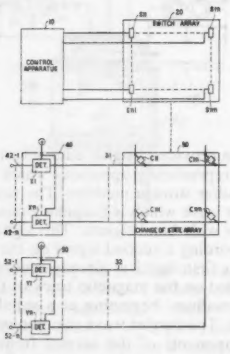
This invention relates to an automatic recording level control device for a magnetic tape recorder, comprising a rectifying circuit for obtaining a DC signal to be used for calculating an average value of the recording current in the recording circuit, a detecting circuit which senses the output of said rectifying circuit and creates a variation in the output of the detecting circuit when the sensed output reveals that the recording current has reached an appropriate recording level, a driving means to cause variation in the resistance of a variable resistor for the purpose of controlling the recording level of the recording circuit, and an engaging and stop means which engages with the driving means and stops the movement thereof, depending on the value of the output of the detecting circuit, so that the variation of the variable resistor is stopped at an appropriate position, whereby the recording level of the recorder is automatically controlled to an appropriate value along with the initiation of the recording operation.

3,604,860

CHANGE OF STATE DETECTOR

Robert F. Buchheit, Reynoldsburg, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.

Filed Dec. 30, 1969, Ser. No. 889,254
Int. Cl. H04m *3/24*
U.S. Cl. 179—175.2 C **10 Claims**



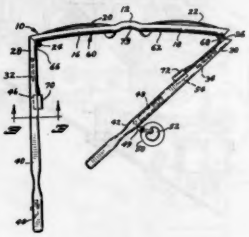
An arrangement for identifying the change of state of any one of a group of switching devices includes first and second groups of intersecting conductors. Each conductor is connected through a signal detector to an energy source. Switching means associated with each one of the devices momentarily connects a distinct pair of intersecting conductors whereby a distinct pair of detectors identifying a switching device is activated.

3,604,861

SPECTACLE HEARING AID WITH CROSSOVER SIGNAL ROUTING

Frederick W. Lewis, and William M. Sanzone, both of Minneapolis, Minn., assignors to The Telex Corporation, Tulsa, Okla.

Filed Apr. 25, 1969, Ser. No. 827,457
Int. Cl. G02c *11/06;* **H04r** *25/00*
U.S. Cl. 179—107 S **2 Claims**



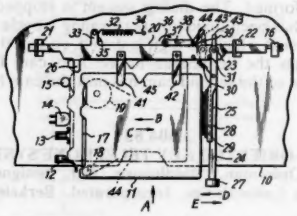
A spectacle hearing aid for directing sound signals from the side of a patient's head having a severe hearing loss to the side having normal or near normal hearing. The apparatus includes a microphone in one of the templar members of the spectacles for converting sound energy to electrical impulses and a conductor assembly adhesively bonded to the rear of the spectacle frame in a position extending transversely above the spectacle lenses. One end of the conductor assembly is connected to the microphone. The other end is connected to means for converting electrical impulses back to sound energy. In one application, the microphone is provided in one of the templar members. The ear with normal or near normal hearing is fitted with the templar member containing an amplifier. Provision is made for sound to enter the good ear in a normal manner and in addition to receive amplified sound from the other side of the head. In another application, microphones are provided on both sides of the head for receiving and amplifying sounds on both sides of the head and for transmitting the resulting amplified sound to the good ear.

3,604,862

TAPE-CARTRIDGE-POSITIONING APPARATUS

Itsuki Ban, 829 Higashi-Oizunimachi Nerima-Ku, Tokyo-to, Japan

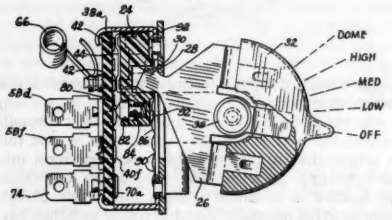
Filed Dec. 16, 1969, Ser. No. 885,476
Claims priority, application Japan, Dec. 18, 1968, 43/92338
Int. Cl. G11b *23/04*
U.S. Cl. 179—100.2 Z **9 Claims**



A tape cartridge positioning apparatus for an endless magnetic tape cartridge player wherein a reciprocating lever

member is slidably supported on a deck in the player housing and normally placed in a first position, a tape cartridge is transversely inserted in the housing through an opening and laid on the deck, the tape cartridge being interposed between a rear arm and a front arm provided on the lever member, the lever member being manually slided from a first position to a second position whereby the rear edge of the cartridge is urged by the rear arm to be moved to the playing position. The reciprocating lever member which is moved to the second position against the bias of a tension spring is retained by a latching means thereby holding the tape cartridge in the playing position. In response to release of retention of the latching means the reciprocating lever member is returned to the first position by the bias of the tension spring at the same time the cartridge is returned to the nonplaying position as the front edge thereof is urged by the front arm.

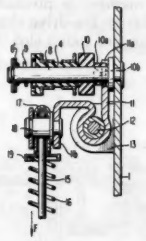
3,604,863
MULTIPOSITION ELECTRICAL SWITCH
William N. Schink, Crystal Lake, Ill., assignor to Indak Manufacturing Corp., Northbrook, Ill.
Filed July 7, 1969, Ser. No. 839,473
Int. Cl. H01h *15/00*
U.S. Cl. 200—16 R **14 Claims**



Twin contactors are mounted on a movable carriage and are engageable with contacts arranged in first and second rows. The contacts in one row are staggered relative to the contacts in the other row. In successive positions of the carriage, the contactors alternately form conductive bridges between adjacent contacts in the rows. A first interconnecting strap extends between staggered contacts in the two rows so that both of such contacts may serve as battery or feed contacts. A second strap extends between another pair of staggered contacts in the two rows to provide duplicate switch positions. Two additional contacts are positioned opposite each other at one end of the rows. An additional contactor is mounted on the carriage to form a bridge between such additional contacts in one extreme position of the carriage. The additional contactor is of small size and is offset laterally away from one of the rows of contacts so that the additional contactor does not form a bridge between the staggered contacts.

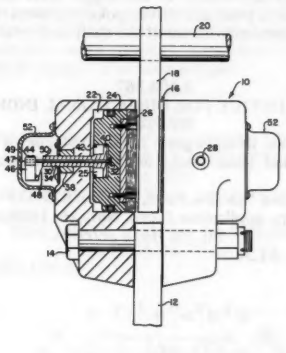
3,604,864
POINT CONTACT MOUNTING FOR IGNITION DISTRIBUTORS
Roger Jean Habert, Paris, France, assignor to Ducellier et Cie, Paris, France
Filed Feb. 18, 1970, Ser. No. 12,396
Claims priority, application France, Feb. 24, 1969, 6904662
Int. Cl. H01h *19/00*
U.S. Cl. 200—19 R **9 Claims**

Pitting of the ignition contacts of an ignition distributor is avoided by effecting relative displacement or wiping action between the fixed and movable contacts. The wiping action is achieved by shifting the breaker arm axially on its pivot shaft in response to variations in the intake manifold pressure of the associated internal combustion engine. The contacts may therefore be associated with a distributor which does not employ manifold or vacuum advance characteristics. When the breaker arm pivot shaft is parallel to the distributor rotor shaft, provision of helically extending lobes on the distributor cam will also effect advance-retard characteristics in response to axial movement of the breaker arm on its pivot shaft. Alternatively, with a distributor cam having lobes extending parallel to the axis of the rotor shaft, inclination of



the pivot shaft for the breaker arm likewise effects the advance-retard characteristics. In all arrangements, axial shifting of the breaker arm on its pivot shaft effects a wiping action between the fixed and movable contacts.

3,604,865
BRAKE POSITION INDICATOR
Carl E. Bricker, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed May 13, 1970, Ser. No. 36,903
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.4 **7 Claims**

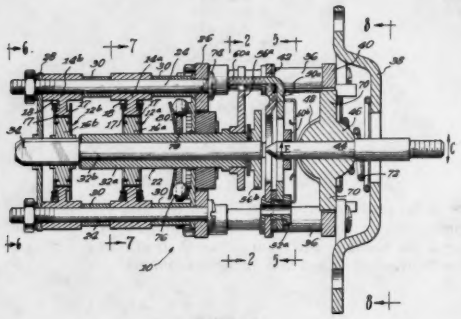


A device for indicating when the pads of a disc brake system are in contact with the brake disc. The device automatically compensates for the gradual reduction of thickness of the brake pads through wear. A pin extends rearwardly through the housing, is attached at one end to the piston and carries at its outer end a microswitch. A second pin also extends through the housing parallel to the first pin and contacts the operating lever of the switch as the piston moves toward the disc. The second pin is frictionally retained in the housing and is attached to the piston by a connection which causes movement of the second pin only when the piston moves beyond a predetermined amount.

3,604,866
FOUR-WAY TOGGLE SWITCH WITH IMPROVED JOYSTICK CONTROL MECHANISM
John Darvasi, Des Plaines, Ill., assignor to Oak Electro/Netics Corporation
Filed Sept. 18, 1969, Ser. No. 859,144
Int. Cl. H01h *19/00, 21/00*
U.S. Cl. 200—6 A **12 Claims**

A rotor-actuating means for use in a rotary switch which includes at least one generally planar switch section disposed

along a drive shaft with the rotor of the switch section being driven by the drive shaft. A toggle lever is pivotally mounted on a frame generally concentric with the axis of the drive shaft for generally linear reciprocating movement in at least one plane generally perpendicular to the plane of the switch section. A drive yoke member is pivotally mounted on the frame at a point spaced from the drive shaft adjacent one end of the shaft with an elongate radial slot intersecting the axis



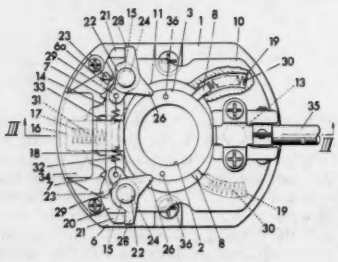
of the shaft and receiving the toggle lever, and with an axially extending arm diametrically disposed on the side of the drive shaft opposite the pivot point for the drive yoke member. A driven yoke member is fixed on the shaft and has a radially extending slot for receiving the arm of the drive yoke whereby linear movement of the toggle lever is translated through the drive yoke and driven yoke members to an increment of rotational movement of the shaft and rotor.

3,604,867

RELEASE DEVICE FOR DIRECTIONAL INDICATOR SWITCH

Masaru Suzuki, Hekikai-gun, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Japan

Filed Nov. 24, 1969, Ser. No. 879,435
Claims priority, application Japan, Nov. 25, 1968, 43-103079
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.34 **7 Claims**



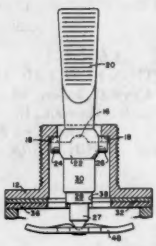
An automatic release device for a vehicle directional switch indicator mechanism, wherein a frame member is disposed in surrounding relationship to the steering shaft and a support member or bracket is movably mounted on the frame and is connected to manual actuating lever. The support member is spring biased into a neutral position and is displaceable in opposite directions into operative positions which cause closing of suitable switches to indicate suitable vehicle turn signals. The support member has a further ratchet support element mounted thereon which has a pair of pivotal ratchets mounted adjacent opposite ends thereof and disposed for coaction with suitable pins secured to the steering axle. The ratchet support member is floatably mounted for limited movement relative to the bracket and the ratchet support member has suitable stop members which coact between the frame and the bracket for permitting the bracket to be returned to its neutral position when the steering axle is likewise returned to its original position.

3,604,868

LOCKING TOGGLE SWITCH

Kent J. Batcheller, and Earl Bullis, Jr., both of Westwood, Mass., assignors to Joseph Pollak Corp., Boston, Mass.

Filed July 30, 1970, Ser. No. 59,420
Int. Cl. H01h *13/28*
U.S. Cl. 200—67 G **8 Claims**



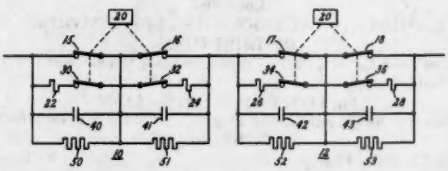
A toggle switch designed to prevent accidental actuation. The switch may be locked against operation by pushing the toggle into the body of the switch and turning it through 90°. Conversely, the toggle must be pushed and twisted through 90° to return the toggle from the locked position into the normal operating position. The mechanism by which the locking feature is obtained utilizes the toggle pivots and operating grooves normally found in toggle switches but adds a second set of grooves perpendicular to the normal operating grooves and into which the toggle pivots may be shifted. The conventional spring used for plunger pressure in a toggle switch also serves to hold the toggle pivots in either set of grooves. In an alternative embodiment, the switch may be of the double-throw type capable of being locked in any position, the toggle being captured in the same manner as in the single-throw version by being pushed into the body of the switch and turned through 90°.

3,604,869

HIGH-VOLTAGE MULTIBREAK CIRCUIT BREAKER WITH MEANS FOR ACCELERATING RESTORATION OF NORMAL VOLTAGE DISTRIBUTION FOLLOWING SPARKOVER AND CLEARANCE OF ONE BREAK

Walter R. Wilson, Wallingford, Pa., assignor to General Electric Company

Filed July 3, 1969, Ser. No. 838,831
Int. Cl. H01h *33/02*
U.S. Cl. 200—144 AP **4 Claims**



A high-voltage multibreak electric circuit breaker that has capacitors connected across its series breaks to uniformly distribute voltage across the breaks when the breaker is open. Should one of the breaks of the open circuit breaker sparkover and immediately clear, restoration of normal voltage distribution across the breaks is accelerated by a plurality of very high ohmic resistors respectively connected in parallel with the capacitors.

3,604,870

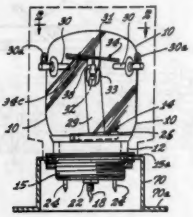
MAGNETICALLY OPERATED ENVELOPE ENCLOSED HIGH-VOLTAGE RELAY

Victor E. De Lucia, Los Angeles, Calif., assignor to Torr Laboratories, Inc., Los Angeles, Calif.

Continuation-in-part of application Ser. No. 840,380, July 9, 1969. This application Mar. 2, 1970, Ser. No. 15,762

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 7 Claims



A high-voltage vacuum relay is provided of the double-pole, doublesthrow type and which has particular application to medical purposes, although it is not limited to uses. The movable and fixed contacts of the relay are mounted with an envelope, with the movable contacts supported by the envelope for pivotal movement, and for selective engagement with the fixed contacts in a manner such that under no conditions will one contact of any pair open without the other.

3,604,871

GAS BLAST CIRCUIT-INTERRUPTING DEVICE HAVING QUICK-ACTING CONTACT RELEASE MEANS

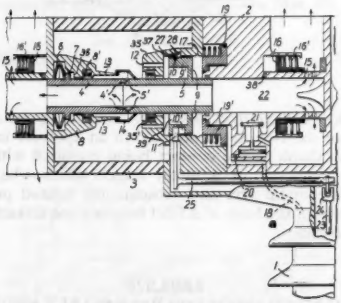
Karl Kriechbaum, Kassel, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Germany

Filed Feb. 18, 1970, Ser. No. 12,172

Claims priority, application Germany, Apr. 5, 1969, P 19 17 724.3

Int. Cl. H01h *33/00*

U.S. Cl. 200—148 13 Claims



A circuit-interrupting device having extremely short switch-off times with a pressure chamber designed to contain a quenching gas under pressure and a pair of oppositely opposed contacts guided for a limited movement within the pressure chamber. A spring biases one of the contacts toward the other; and a quick-acting release device, such as a piston ring lock, holds the other contact against the first contact under high contact pressure when the interrupting device is in its switch-on position. The contact that is retained by the release device is biased only by the quenching gas in the switch-off direction. When the release device releases this contact, the two contacts separate from each other very rapidly. The contacts are sealed so that the quenching gas can not escape through the hollow bore of the contacts until they have separated. The release device may be provided with a suitable device to compensate for temperature fluctuations. The actuation of the release device may occur in dependence on the net current in the circuit, so that the separation of the tubular contacts occurs under minimum arc duration and, thus, with minimum switching effort.

3,604,872

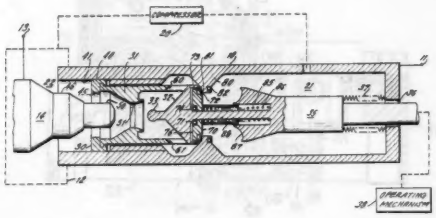
PRESSURIZED GAS INTERRUPTER STRUCTURE

George A. Wilson, Media, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Apr. 19, 1970, Ser. No. 29,401

Int. Cl. H01h *33/86*

U.S. Cl. 200—148 B 9 Claims



A pressurized SF_6 gas interrupter structure is used with a conventional mechanical circuit breaker operating mechanism. The operating mechanism is not opposed by high gas pressure, used for arc interruption, while the high gas pressure is used for high initial contact parting speeds. Maximum gas flow is obtained during contact opening for arc extinction purposes, while gas flow is restricted during closing to conserve the supply of pressurized gas.

3,604,873

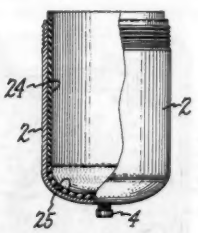
LIQUID-FILLED ELECTRICAL CIRCUIT INTERRUPTER HAVING A FLUID PRESSURE-RESISTANT INSULATING COATING

Vincent J. Boliver, Pittsfield, Mass., assignor to General Electric Company

Filed July 14, 1969, Ser. No. 841,204

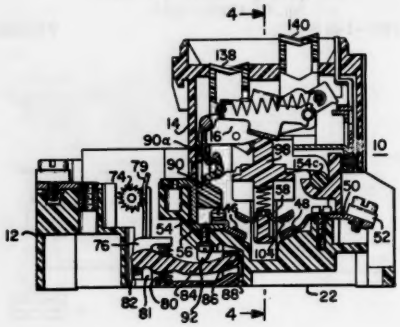
Int. Cl. H01h *33/68*

U.S. Cl. 200—150 R 5 Claims



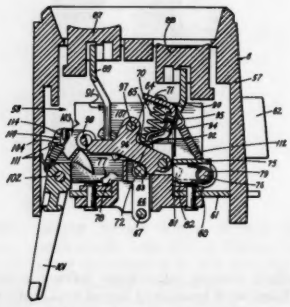
An electric circuit interrupter having a metal container partially filled with insulating liquid and housing arc-developing circuit interrupting means characterized by having a coating of thermal-setting epoxy resin-insulation material immovably bonded to the surface of said container adjacent the arc-developing means thereby to permanently insulate that surface from arcs developed by the arc-developing means. The insulating coating and bonding arrangement of the invention are particularly resistant to displacement by high-pressure liquid circulated in the container by arc-generated gases.

3,604,874
MOVABLE CONTACT GUIDING AND ACTUATING MECHANISM IN A MANUALLY OPERATED ELECTRIC SWITCH
Jordan F. Puetz, Milwaukee, Wis., assignor to Square D Company, Park Ridge, Ill.
Filed Feb. 6, 1970, Ser. No. 9,203
Int. Cl. H01b 3/00
U.S. Cl. 200—153 G 9 Claims



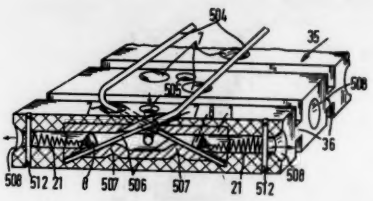
A manually operated switch having a toggle-acting mechanism which applies positive pressure between the contacts during the interval the toggle levers are passing through the pivot center of the toggle levers. The switch includes a stabilizer which prevents the movable contact carrier from tilting so that an offcenter load may be applied on the contact carrier and a lever arrangement which will cause the operating buttons of the switch to become aligned when the switch is tripped in response to an electrical overload in the circuits controlled by the switch.

3,604,875
MODULAR ELECTRIC SWITCH WITH TOGGLE ACTUATING MEANS
Robert E. Walters, Bayside, and Gerd C. Boysen, Milwaukee, both of, Wis., assignors to Allen-bradley Company, Milwaukee, Wis.
Division of Ser. No. 488,548, Sept. 20, 1965, Pat. No. 3,430,014
Filed Aug. 2, 1968, Ser. No. 749,716
Int. Cl. H01h 3/46
U.S. Cl. 200—153 G 2 Claims



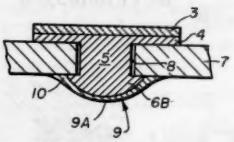
An electric switch with a snap action mechanism including toggle links joined at a knee. Holding means retain the knee of the toggle as the mechanism passes an overcenter position and thereafter release the knee at a selected point while biasing means assist in returning the mechanism and a connected contact carrier from a toggle position in which the toggle links are extended.

3,604,876
ELECTRICAL CONTACT DEVICE
Max Pasbrig, Casa Luce-Via all'Eco, Orselina, Switzerland
Continuation-in-part of application Ser. No. 700,933, Jan. 26, 1968, now Patent No. 3,551,883. This application Dec. 23, 1968, Ser. No. 785,921
Int. Cl. H01h 9/02; H01r 7/06
U.S. Cl. 200—166 CT 47 Claims



An electrical contact device comprising a housing having elongated recesses associated in pairs, extending at an acute angle and forming a channel. Spring loaded clamping members are arranged in the elongated recesses. Electrical conductors introduced through the elongated recesses are automatically locked and retained by the clamping members and the clamping members are tilted from their inoperative position into a position in which they rest against the electrical conductor.

3,604,877
ELECTRICAL CONTACT ASSEMBLY
John R. Cockshutt, Red Bank, N.J., assignor to Engelhard Minerals & Chemicals Corporation
Filed Dec. 2, 1969, Ser. No. 881,510
Int. Cl. H01h 1/02
U.S. Cl. 200—166 C 1 Claim

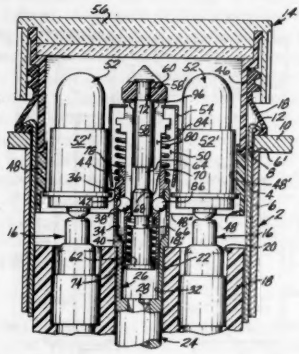


An electrical contact assembly comprising an electrical contact of the rivet type mounted in an aperture in a metal arm. The shank of the contact being provided with an end portion composed of a metal solder which when staked against the metal arm and subsequently heated provides a solder joint in the form of a fillet between the staked end and the metal arm.

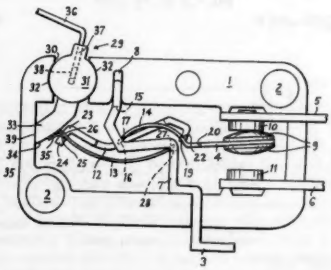
3,604,878
LATCH MECHANISM FOR RELEASABLY ENGAGING PUSHBUTTON CAPS IN ELECTRICAL DEVICES
James W. Amis, Jr., Bellevue; Maurice D. Fuller, Mercer Island, and James B. Dobson, Seattle, all of, Wash., assignors to Korry Manufacturing Company, Seattle, Wash.
Filed May 22, 1969, Ser. No. 826,962
Int. Cl. H01h 9/18
U.S. Cl. 200—167 A 13 Claims

A latch mechanism is disclosed whereby pushbutton caps and the like may be releasably engaged in electrical devices having flange means on a relatively stationary member therein, forming abutments on the opposite sides thereof. The mechanism includes an elongated element which is longitudinally reciprocated in relation to the member transverse to the flange means, during engagement and disengagement of the cap; and which has a pair of longitudinally spaced recesses therein forming a land therebetween which is spaced from the flange means on the member as the land passes the

flange means in the reciprocable motion of the element. In addition, the mechanism includes slidably guided detent ball means on the land, and a pair of stop means which are slidably mounted on the element over the recesses, and yieldably biased relatively toward one another along the longitudinal axis of the element, with the detent ball means retained therebetween so that the detent ball means tends to remain on the land. The stop means are operatively insertable into the space between the land and the flange means, and the detent ball means is larger in dimension than the width of the space, but adapted to shift from side to side of the flange means under the bias of one of the stop means, when the detent ball means is displaced into the adjacent recess against the bias of the respective stop means as a consequence of abutting the adjacent side of the flange means as the element is reciprocated in relation to the member.

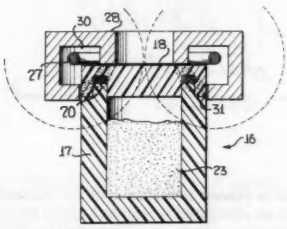


3,604,879
LEVER-OPERATED MICROSWITCHES
Donald Courtney Beer, Newick, England, assignor to Otehall Limited, Sussex, England
Filed May 26, 1969, Ser. No. 827,733
Claims priority, application Great Britain, May 29, 1968, 25819/68
Int. Cl. H01h *3/02*
U.S. Cl. 200—172 B **8 Claims**



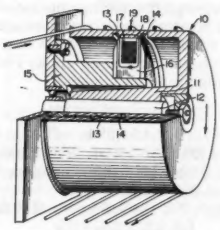
An electric switch, particularly a microswitch, comprises an insulating casing housing the switch movement or mechanism. A rockable actuating member for the mechanism is mounted in an opening in the casing and, inside the latter, operates on a member of the mechanism. Rocking movement of the actuating member actuates the switch mechanism and causes a contact-carrying arm of the mechanism to snap over from one contact position to another. The actuating member is rockably mounted in the opening in the switch casing by means of a cylindrical boss portion of the actuating member engaged in generally part-cylindrical bearing recesses formed respectively in opposite sides of the opening.

3,604,880
FLUX CONCENTRATOR
Roger M. O'Neill, Oaklawn, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Division of Ser. No. 655,931, July 25, 1967, Pat. No. 3,548,140
Filed June 22, 1970, Ser. No. 48,412
Int. Cl. B23k *13/02*
U.S. Cl. 219—10.53 **2 Claims**



This disclosure relates to apparatus for inductively coupling energy into heat activated magnetic sealing material to effect the sealing of containers. Such apparatus includes a coil generally conforming to the shape of the container portion to be sealed and a flux concentrator of relatively high permeability and electrical resistivity for concentrating magnetic flux only in those areas of the container including the sealing material. The flux concentrator houses the coil and is formed with an air gap shaped to accommodate the container portion to be sealed. Further, this application discloses a method of sealing containers by coupling energy into heat activated magnetic sealing materials while limiting the heating of adjacent portions of the container and the container contents.

3,604,881
APPARATUS FOR INTRODUCING A LATENT CRIMP INTO A YARN
Hendrinus Sempel, Arnhem, Netherlands, assignor to American Enka Corporation, Enka, N.C.
Filed July 3, 1969, Ser. No. 838,998
Claims priority, application Netherlands, July 8, 1968, 6,809,645
Int. Cl. H05b *5/00, 3/02*
U.S. Cl. 219—10.61 **1 Claim**



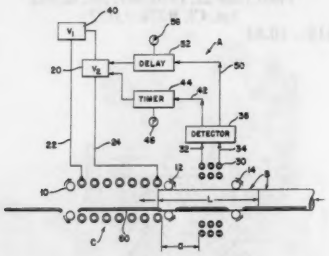
A yarn transport roll is divided into annular regions and magnetic lines of force are introduced into one narrow annular region for heating purposes.

3,604,882

POWER CONTROL DEVICE FOR AN INDUCTOR

Richard F. Seyfried, Parma Heights, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed July 24, 1970, Ser. No. 58,003
Int. Cl. H05b *5/00, 5/04*
U.S. Cl. 219—10.69 **5 Claims**



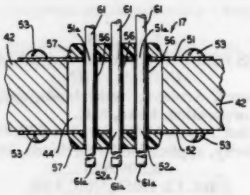
A sensing coil is placed in advance of an inductor used to inductively heat an elongated workpiece and a low-level voltage below the heating voltage, is maintained on the inductor. As the workpiece passes through the sensing coil into the energized inductor, an induced voltage is created within the sensing coil. This induced voltage is used to increase the voltage across the inductor to the induction heating level. As the workpiece exits from the sensing coil, the voltage across the inductor is decreased again to its low level.

3,604,883

MULTIPLE ELECTRODE ASSEMBLY FOR ELECTRICAL DISCHARGE MACHINING

Clifford H. Dietz, Indianapolis, Ind., assignor to Engineered Models Corporation, Indianapolis, Ind.

Filed Mar. 26, 1969, Ser. No. 810,766
Int. Cl. B23p *1/08;* **H01t** *13/28*
U.S. Cl. 219—69 **2 Claims**



The invention is embodied in an assembly providing multiple, closely spaced electrodes for attachment to a conventional electrical discharge machining apparatus. The relatively slender (small-diameter) rod electrodes are each held in an encircling tube which is rigidly held in two spaced, parallel plates with a material such as an epoxy resin adhering to the plates and sealing the tubes in place.

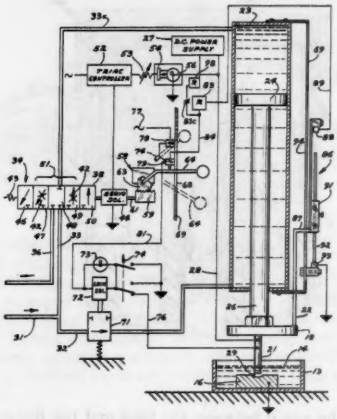
3,604,884

ELECTRODE FEED CONTROL FOR EDM MACHINE

Sven Olof Olsson, Richfield, Minn., assignor to Essar Corporation, Minneapolis, Minn.

Filed Apr. 24, 1969, Ser. No. 819,006
Int. Cl. B23p *1/14*
U.S. Cl. 219—69 G **23 Claims**

An electrical discharge machining device or EDM machine having an electrode movable toward and away from a workpiece by a hydraulically operated double acting cylinder. A control valve, combined with a servo solenoid and manually operated lever, is operable to control the flow of hydraulic fluid to the cylinder. A light responsive electrical control operates the servo solenoid in response to the size of the electrical discharge gap between the electrode and the workpiece. Interposed in the fluid line to the hydraulic cylinder is a lock valve operable to lock the cylinder and fix the position of the electrode relative to the workpiece. The manually controlled lever is operable to engage switches to override the lock valve control during the electrical machining and elevation of the electrode operations of the device. Hydraulic pressure is continuously supplied to the control valve from a pair of liquid storing chambers connected to the control valve with a switching valve. Fluid under pressure in either one of the chambers operates the switching valve to provide a continuous source of hydraulic fluid under pressure to the control valve.

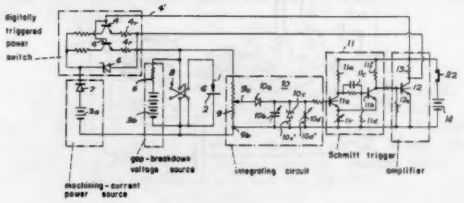


3,604,885

EDM POWER SUPPLY FOR GENERATING SELF-ADAPTIVE DISCHARGE PULSES

Kiyoshi Inoue, 100 Sakato, Kavaski, Kanagawa, Japan

Continuation-in-part of application Ser. No. 682,824, Nov. 14, 1967, now Patent No. 3,359,755, which is a continuation-in-part of application Ser. No. 493,473, Oct. 6, 1965, now Patent No. 3,360,683. This application July 2, 1969, Ser. No. 838,575
Int. Cl. B23p *1/08*
U.S. Cl. 219—69 P **47 Claims**



An EDM (electric-discharge machining) power supply system for generating self-adaptive discharge pulses wherein an electrode is spacedly juxtaposed with a workpiece across a discharge gap while a dielectric liquid coolant is passed therethrough. The electrode and the workpiece are relatively displaced during the machining of the latter to maintain the gap spacing generally constant via a servomechanism. According to the invention, there is applied across the electrode and the workpiece a direct-current arc-striking voltage suffi-

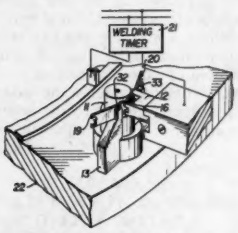
cient to initiate discharge across the gap while permitting the voltage to build up thereacross to a level constituting a function of conductivity characteristics of the gap and to decay with a discharge across the gap. An analog signal is derived across the gap and represents the voltage buildup and decay thereacross. Machining current flow through the gap across the electrode and the workpiece is triggered by a digital signal derived when the analog signal exceeds a threshold value and initiation of the discharge is induced by the arc-striking voltage. A second digital condition terminates the machining current flow which is controlled by a semiconductive power switch turned on and off instantaneously in dependence upon the digital conditions. A limited current high-voltage source is connected in a closed loop circuit with the electrode, the workpiece and the gap to provide the voltage buildup across the latter, while the voltage across the gap is detected by a voltage divider or the like and the output of this voltage divider is supplied via an integrating circuit in a squaring or gating-type logic device, e.g., a Schmitt trigger capable of producing the digital output for triggering the semiconductive power switch of the machining-current power supply.

3,604,886

WELDING JIGS FOR ALIGNING MOUNTING STRAPS ON CYLINDRICAL CRT ELECTRODES

Chester O. Merchant, Owensboro, Ky., assignor to Kentucky Electronics, Inc., Owensboro, Ky.

Filed Mar. 9, 1970, Ser. No. 17,623
Int. Cl. B23k *9/12;* **B21j** *13/08*
U.S. Cl. 219—80 **4 Claims**



A jig is arranged with a cylindrical metallic post for receiving a cylindrical CRT electrode snugly thereover arranged adjacent a pair of separated shaped insulating mounts with protruding fingers above a rest platform for engaging the ends of and confining a mounting strap with a cylindrical section conforming to the outer surface of the cup electrode, so that the strap is held in place adjacent the cylindrical electrode in a loosely fitting arrangement into which a welding head may be moved into the cylindrical section between said fingers to push the strap closely adjacent the cylinder and weld it thereto.

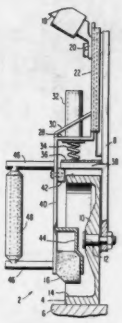
3,604,887

ROLLER ELECTRODE SOLDERING OR BRAZING DEVICE

Charles A. Newton, 1335 O Street, Anchorage, Alaska

Filed Apr. 15, 1970, Ser. No. 28,854
Int. Cl. B23k *11/06*
U.S. Cl. 219—84 **5 Claims**

A hand-held soldering device has a rotary electrode through which one side of an electrical circuit is completed



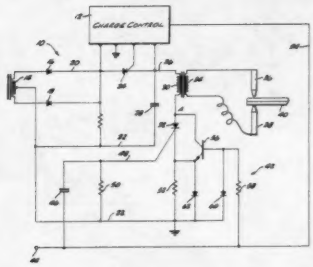
to the work when the device is pressed against the work.

3,604,888

WELD CONTROL CIRCUIT

Richard G. Friess, San Marcos, and Tor Hougen, Oceanside, both of, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 26, 1970, Ser. No. 14,421
Int. Cl. B23k *11/26*
U.S. Cl. 219—113 **3 Claims**



A charged capacitor is connected in series with a pulse welder transformer primary and a switching SCR. The weld control circuit is connected to fire the SCR, when the weld pulse is required. A transistor connected across the SCR shunts the SCR to positively reduce the SCR current below its holding current value. The SCR current is measured so that the transistor is not turned on until the current is at a safe value.

3,604,889

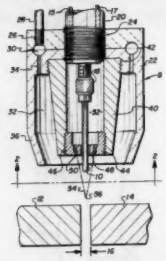
PLASMA-GENERATING METHOD AND MEANS

Roderick Rohrberg, Torrance, Calif., assignor to North American Rockwell Corporation and Air Products and Chemicals, Inc., Allentown, Pa., part interest to each

Continuation-in-part of application Ser. No. 693,365, Dec. 16, 1967. This application May 8, 1969, Ser. No. 830,565
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 P **14 Claims**

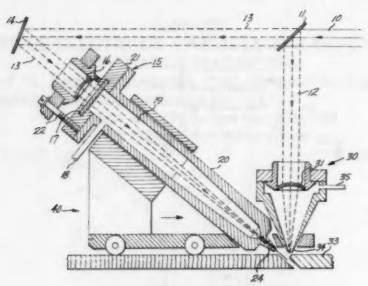
An inert gas welding torch is used to create plasma by directing one or more discrete high velocity jet gas streams into a welding arc between the electrode and the workpiece. The plasma stream is controllable with regard to energy content or location by varying the amount or direction of the inert gas flow. The plasma stream is insensitive to variations

of arc length, and permits abnormally high current densities in the electrode. When used with consumable electrodes, the



invention is useful for casting as well as for deep welding heavy plate materials in a single pass.

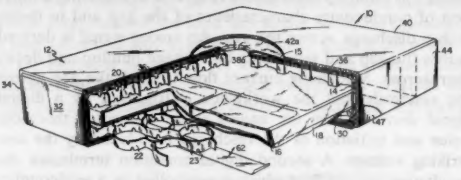
3,604,890
MULTIBEAM LASER-JET CUTTING APPARATUS
George J. Mullaney, Seattle, and John M. Webster, Tukwila, both of, Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Oct. 15, 1969, Ser. No. 866,549
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 L **12 Claims**



A multibeam laser-oxidizer system which optimizes the cutting performance of a laser cutting tool. Two laser beam systems of different focal length are focused on substantially the same area of the material to be cut. The beam of shortest focal length provides a preheat zone with the short depth of focus and small spot size (compared to the second beam) serving to bring the material to a temperature such that a jet of oxidizing gas applied to the heated spot gives rise to the initiation of the cut. The long focal length lens system concentrates the radiant energy of the second beam over a large depth of focus compared to the preheat beam and as a result a uniform cut through a substantial thickness of material is achieved. Details of the lens systems and cutting toolhead are provided together with details of gas flow openings in the cutting tool for supplying both oxidizing and inert shield gases to the cutting area.

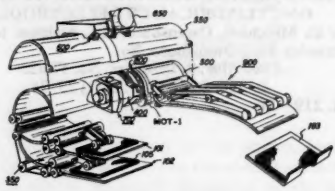
3,604,891
ELECTROLYTIC HEATING
Milton S. Cohen, 41 Scituate St., Arlington, Mass.
Filed May 1, 1969, Ser. No. 820,934
Int. Cl. H05b *1/00*
U.S. Cl. 219—200 **20 Claims**

Heating an electrolytic solution by placing at least three spaced electrodes in direct contact with the solution and connecting two of the electrodes to a source of power to cause



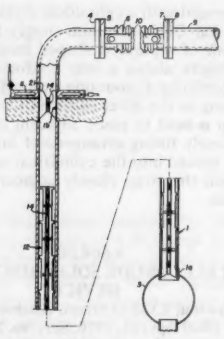
electrical current to pass between the two electrodes along a path including the solution and the third electrode.

3,604,892
FUSING APPARATUS
Charles Louis Huber, Marion, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Division of Ser. No. 733,468, May 31, 1968, Pat. No. 3,535,492
Filed Mar. 5, 1970, Ser. No. 26,455
Int. Cl. G03g *13/20*
U.S. Cl. 219—216 **7 Claims**



Apparatus for permanently affixing electroscopic toner particles in image configuration to an electrographic support material upon which the toner powder is electrostatically bonded including a plurality of radiant heating elements supported for movement in a circular path adjacent to and transverse of the path of support material movement such that the toner powder is uniformly fused to the support material by the rotating heating elements passing adjacent thereto.

3,604,893
METHOD AND APPARATUS FOR ELECTRICALLY HEATING A FLUID
Anthony Horton, Welwyn Garden City, England, assignor to Laporte Titanium Limited, London, England
Filed Oct. 7, 1968, Ser. No. 765,562
Claims priority, application Great Britain, Oct. 11, 1967, 46500/67
Int. Cl. F24h *1/10*; **H05b** *1/00*
U.S. Cl. 219—300 **29 Claims**



A process and apparatus for heating fluids, particularly gaseous halides of titanium, silicon, aluminum, zirconium and

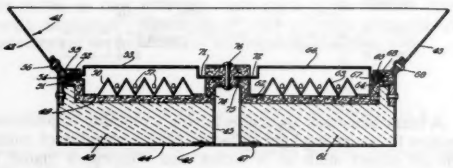
mixtures thereof. The fluid to be heated is passed through at least one metal tube which has a plurality of metal fins disposed internally of said tube, the fins being in electrical contact with the wall of the tube. An electrical potential is applied between two points spaced apart along the length of the tube to cause an electric current to flow through the wall of said tube and said fins to thereby heat the tube wall and the fins. The configuration of said tube wall and said fins is such that the cross-sectional area of the flow path of the electric current between the said two points increases in the direction of flow of the gas in said tube to thereby prevent the temperature of the inner surface of the wall of the tube from increasing in the direction of flow of said fluid. In addition, the configuration of the fins is such that the temperature of the surface of the fins that are exposed to the fluid does not substantially exceed the maximum temperature of the inner surface of the wall of the tube between said two points.

3,604,894

ELECTRICAL INFRARED RADIATION SYSTEM

William G. Milligan, 1618 San Angelo Blvd., San Antonio, Tex.

Filed May 22, 1968, Ser. No. 731,154
Int. Cl. H05b *3/20*
U.S. Cl. 219—377 **6 Claims**



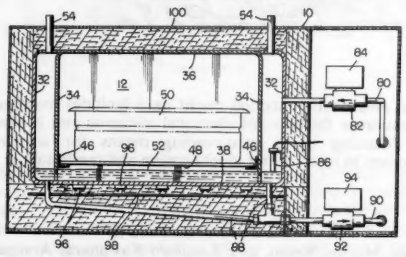
A heating assembly of improved efficiency wherein electrically energized heating elements are disposed between the peaks of ridged heat-absorbing and re-radiating surfaces and preferably combined with a convection-reducing wire screen in immediate proximity to the peaks of the surfaces, the angularly disposed ridges and the wire screen cooperating to increase the radiant heat output by a more effective utilization of the heated air and by improved infrared radiation capability.

3,604,895

ELECTRICALLY HEATED STEAM TREATMENT DEVICE

Robert Harold MacKay, Fort Wayne, Ind., assignor to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Oct. 28, 1969, Ser. No. 871,831
Int. Cl. F27d *11/02;* **A21b** *1/00, 1/22*
U.S. Cl. 219—401 **18 Claims**



A steam treatment device in which a chamber having an access door is provided for receiving material to be treated. The access door seals the chamber when closed.

The device includes an arrangement for supplying water to the chamber and an electrical heating arrangement for converting the water to steam and a valve arrangement for maintaining a predetermined steam pressure within the chamber.

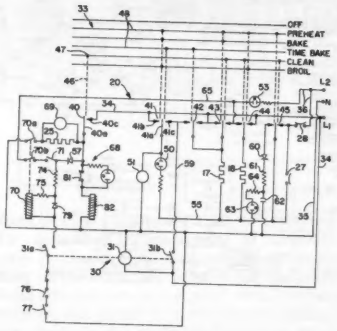
The device has a timer for controlling the length of the treatment cycle and also has interlocks so that the device will operate only when the access door is closed and opening of the access door is prevented while the device is in operation.

3,604,896

ELECTRIC SELF-CLEANING OVEN CIRCUIT

Carl L. Anderson, Shiloh; John T. Lamb, Mansfield, and Ralph J. Norris, Mansfield, all of, Ohio, assignors to The Tappan Company, Mansfield, Ohio

Filed Aug. 21, 1968, Ser. No. 754,304
Int. Cl. A21b *1/40*
U.S. Cl. 219—412 **9 Claims**



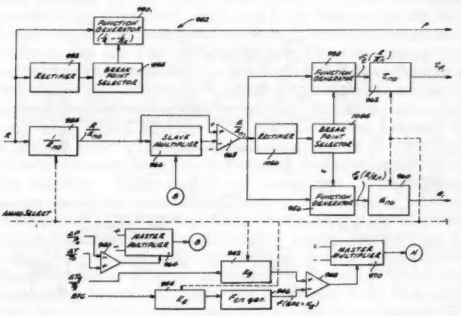
A control circuit for a self-cleaning oven consisting of a switching system for alternatively connecting the bake and broil elements across the 236-volt powerline to generate heat for normal cooking operations, and for connecting the elements in parallel across the 236-volt line during the self-cleaning cycle. A semiconductor rectifier in series with the parallel-connected elements is utilized to control the rate of heat rise during the cleaning cycle to a predetermined cleaning temperature level, and to further limit power application thereafter. The switching system also controls temperature-regulating components and a safety circuit responsive to abnormal operation of the semiconductor rectifier to interrupt the cleaning cycle.

3,604,897

ELECTRONIC BALLISTIC COMPUTER FOR TANK FIRE CONTROL SYSTEM

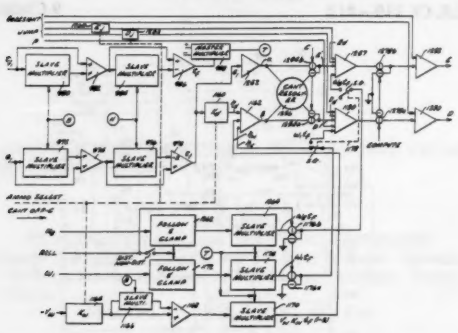
William E. McAdam, Jr., Thousand Oaks; Roy G. Clutterbuck, Los Angeles, and Millard M. Frohock, Jr., Thousand Oaks, all of, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 21, 1968, Ser. No. 754,424
Int. Cl. G06g *7/80*
U.S. Cl. 235—61.5 **26 Claims**



A computer circuit for generating signals related to the ballistics of a plurality of projectile or ammunition types, the

signals including time of flight, superelevation, and ballistics drift signals. The computer includes a plurality of parallel channels, and a first adjustable operational amplifier, which operates on the range information by a selected ballistics normalizing transfer function to generate an individual normalized range signal for a selected individual one of the plurality of projectile or ammunition types, a first multiplier means for multiplying the normalized range signal received from the operational amplifier by a partial derivative of nonstandard air pressure and temperature, each parallel channel including a function generator coupled to receive and operate on the normalized range signal with a nonlinear transfer function common to the ballistics of all of the projectile types for generating an exponential function signal related to the selected projectiles, and a second adjustable operational amplifier coupled to the function generator for operating on the function signal by a selected individual unnormalizing transfer function for each projectile for generating signals related to the ballistics of the projectile, such as superelevation and time of flight on each channel and second and third multiplier means in each channel respectively coupled to multiply the superelevation signal and the time of flight signal by the partial derivative of nonstandard air temperature and air pressure conditions and by the partial derivative of nonstandard propellant grain temperature and effective full charge to correct for changes in standard conditions.

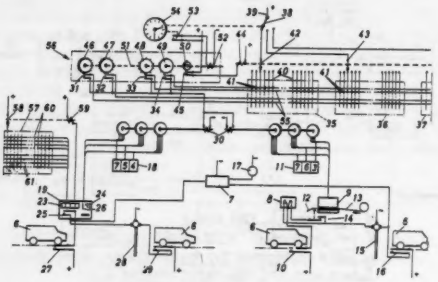


3,604,898

A FULLY AUTOMATIC OR SEMIAUTOMATIC PARKING AREA

Sven Tore Magnus Magnusson, Goteborg, Sweden, assignor to Telub AB, Vaxjo, Sweden

Filed Mar. 15, 1968, Ser. No. 713,488
Claims priority, application Sweden, Mar. 17, 1967, 3730/67
Int. Cl. G06k *17/00*
U.S. Cl. 235—61.6 **3 Claims**



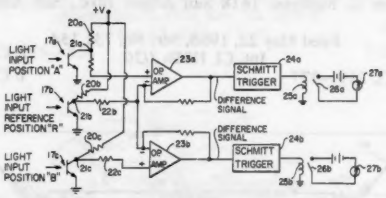
The present invention relates to a fully automatic or a semiautomatic parking plant in which means are arranged for ensuring that the parking fee is calculated in a correct way and this even when different rates are valid for different hours of the day. The parking plant according to this invention is of the kind in which a ticket is received at the entry bearing markings for indicating the entry time and in which a ticket-checking apparatus or cash register is arranged at the exit for sensing the markings on the ticket and calculating the fee. The plant is further provided with a period number work which is driven by means of a programming work driven by a clock work, the period number work adapted to deliver its values to the ticket distributor at the entry of the plant or to the cash register.

3,604,899

MARK-DETECTING SYSTEM

John William Donohoe, South Natick, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Feb. 12, 1970, Ser. No. 10,772
Int. Cl. G06k *7/14*; **G01n** *21/30*
U.S. Cl. 235—61.11 E **10 Claims**



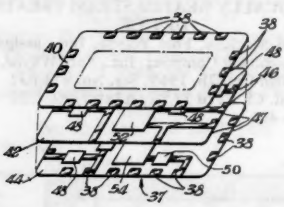
A mark-detection apparatus having a plurality of photodetectors for receiving light reflected from a plurality of points on an object such as a ticket and wherein a signal is generated representing the difference between the light detected by each of the photodetectors to indicate if a ticket has been altered.

3,604,900

ELECTRONIC CREDIT CARD

Charles G. Kalt, Williamstown, Mass., assignor to Sprague Electric Company, No. Adams, Mass.

Filed July 7, 1969, Ser. No. 839,500
Int. Cl. G06r *19/00*
U.S. Cl. 235—61.12 N **2 Claims**



An electrically encoded credit card includes encoded information in the form of electrical elements and is adapted for decoding by a card-reading means for advising a merchant as to customer identification and credit rating.

3,604,901

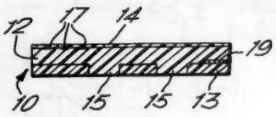
INFORMATION CARD

Tadao Morita, Kyoto, and Kazuhiro Kawahara, Amagasaki, both of, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 2, 1969, Ser. No. 881,416
Claims priority, application Japan, Dec. 5, 1968, 43/106286
Int. Cl. G06k *19/02*
U.S. Cl. 235—61.12 R **11 Claims**

An information card for use in sales transactions, bank deposits or withdrawals and the like, which comprises a bot-

tom layer of a light opaque material having holes formed therein to express a predetermined coded information such as the card identification number and the like, an intermediate layer of a translucent thermoplastic material on said information layer and a top layer of a transparent material covering said intermediate layer for protection of the upper surface thereof. These three layers are formed into a single card of laminated construction. The translucent material of the intermediate layer has a softening point much lower than



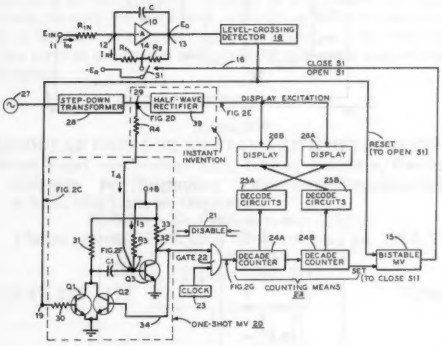
those of the other layers, so that when heated and compressed for lamination, it flows into and fills the information holes in the bottom layer. The material filling the holes reinforces the bottom layer and consequently the card which would otherwise become very weak due to the presence of many holes and yet permits sufficient light to pass through the holes, so that with the other area of the bottom layer being substantially light opaque, very accurate photoelectric detection of the information holes can be achieved.

3,604,902

APPARATUS FOR ELIMINATING FLICKER IN A DRIVEN DISPLAY

Irwin Munt, Elizabeth, N.J., assignor to Weston Instruments, Inc., Newark, N.J.

Filed Apr. 4, 1969, Ser. No. 813,506
Int. Cl. H03k *21/18*; G09f *9/00*
U.S. Cl. 235—92 EA **5 Claims**



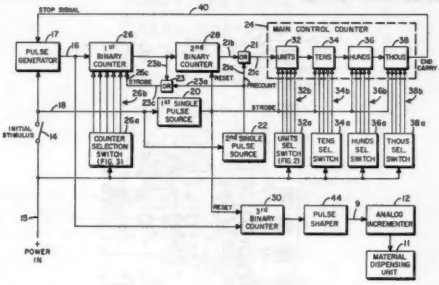
The state of a display-controlling (or driving) binary counter is synchronized to the state of the display controlled thereby. A time-varying signal alternately extinguishes and excites (strobes) the display and the phase of this signal is used to control the operation of the counter such that the counter does not change state significantly until the display is extinguished. The counter state is controlled by the state of a resistor-capacitor (RC) monostable multivibrator, which in turn, is synchronized while in an unstable state to the time-varying signal. Synchronization is conveniently effected by utilizing the capacitor of the multivibrator to integrate the time-varying signal and using the resulting integrated signal to trigger the monostable into a stable state.

3,604,903

MATERIAL DISPENSING CONTROL SYSTEM

John L. Hill, and Neil B. Howes, both of St. Paul, Minn., assignors to Ramsey Engineering Company, St. Paul, Minn.

Filed Oct. 23, 1968, Ser. No. 769,822
Int. Cl. H03k *21/36*
U.S. Cl. 235—92 PE **14 Claims**



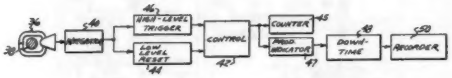
An electronic system produces a train of electrical pulses or signals for controlling the dispensing of materials in different amounts or proportions, such as desired in the automatic batching of concrete. By control settings preset on a main electronic decimal counter, a prescribed number of pulses is delivered by the system to a mechanical analog device which in turn controls the material-dispensing mechanism. Additional presettable electronic counters are combined with the main decimal counter to achieve any number of batch formulations proportioned on the basis of arithmetic ratios established by the control settings selected on the counters.

3,604,904

MONITORING DEVICE

Ariel I. Stiebel, Bloomfield Hills, and Seymour A. Lippmann, Huntington Woods, both of, Mich., assignors to Radex Corporation, Detroit, Mich.

Filed Feb. 6, 1969, Ser. No. 796,974
Int. Cl. G07c *3/10*
U.S. Cl. 235—92 PD **18 Claims**

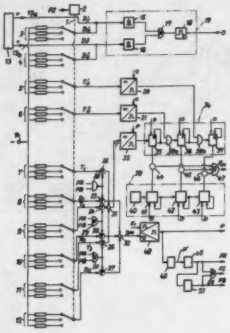


A monitoring device specially adapted for production control purpose by providing one count for each workpiece produced by a machine, such as a forge hammer or the like, which requires an indefinite number of strokes or motions in order to produce a finished workpiece. The total energy consumed by the machine for producing a finished workpiece is transduced into an electrical signal comprising a first train of electrical pulses of a first amplitude duration ratio, corresponding to the working cycle of the machine, followed by a second train of second electrical pulses of a lower amplitude duration ratio, corresponding to the idling cycle of the machine. Those signals are integrated by appropriate means supplying at its output a voltage level varying between a maximum level corresponding to the first train of pulses and a minimum level corresponding to the second train of pulses. The minimum voltage level is used to set a control means which is in turn activated by a voltage level corresponding to approximately the maximum level, and each time the control means is activated, a count is registered. Additionally, diverse indicators are provided for monitoring production cycles of the machine, down time cycles, and for providing a permanent record of production rates.

3,604,905
ELECTRONIC DEVICE FOR THE AUTOMATIC CONTROL OF A RAILWAY TRAIN

Pierre Riondel, Geneva, Switzerland, assignor to Societe Anonyme des Ateliers de Secheron, Geneva, Switzerland

Filed July 12, 1968, Ser. No. 744,553
Claims priority, application Switzerland, Oct. 23, 1967, 14755/67
Int. Cl. B60z 3/00; G06f 15/48
U.S. Cl. 235—150.24 4 Claims

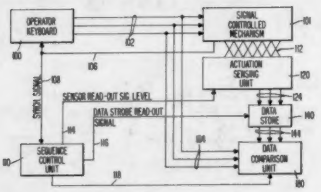


A system for the automatic control of a railway train wherein the itinerary is divided into several zones, in each of which the feed current of the motors can be cut off before the end of the zone is reached by the train if a time interval which is a determined function of the distance counted from the beginning of the zone becomes greater than the real time.

3,604,906
VERIFIER FOR SIGNAL CONTROLLED MECHANISM

James R. Hunter, Chadds Ford, and Ermenegildo Fiorentino, Bridgeport, both of, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 4, 1969, Ser. No. 855,344
Int. Cl. G06k 5/00; H03k 13/32
U.S. Cl. 235—153 10 Claims



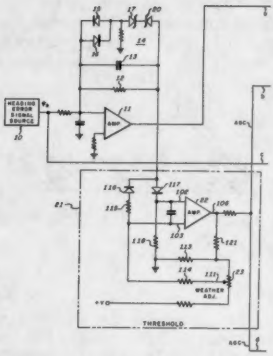
Apparatus for verifying the operation of mechanisms electrically controlled by operator keyboards which includes delayed electrical sensing of the activation of the mechanisms and alternate printing of data corresponding to the keyboard output signals and to the signals transduced from the operation of the mechanisms. In one version of the verifier the actuation sensing is performed by switches to set a storage means which is then read out after a predetermined delay from the time that data signals are received from the keyboard for storage or printing.

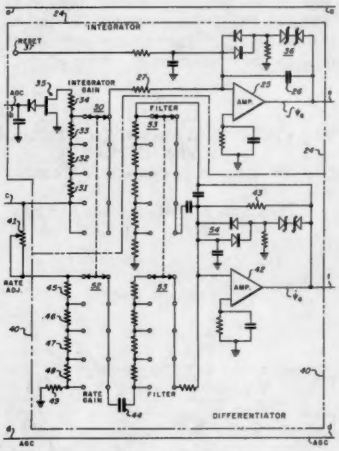
3,604,907
STEERING COMMAND COMPUTER FOR NAVIGABLE CRAFT

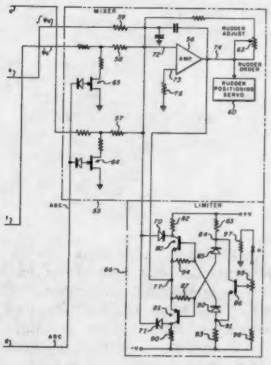
Charles R. Wesner, Crozet, Va., assignor to Sperry Rand Corporation

Filed Mar. 2, 1970, Ser. No. 15,697
Int. Cl. B63h 25/04; G05b 13/02
U.S. Cl. 235—150.2 6 Claims

Computer apparatus for use in navigable craft for providing a steering command signal in response to a heading error signal. A threshold circuit provides a first signal when the magnitude of the heading error signal is not in excess of a threshold and a second signal when the magnitude thereof exceeds the threshold. Gain-controlling circuits are included for effecting a first computer gain in response to the second signal and a lower gain in response to the first signal. Means for adjusting the threshold in accordance with yawing motion of the craft are included.



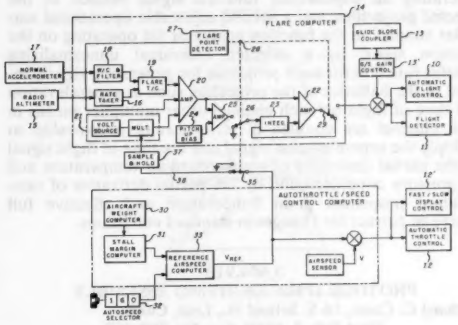




3,604,908
LANDING CONTROL SYSTEM FOR AIRCRAFT

Raymond G. Loome, Phoenix; Harry Miller, Scottsdale, and Robert H. Parker, Phoenix, all of, Ariz., assignors to Sperry Rand Corporation

Filed May 19, 1969, Ser. No. 825,590
Int. Cl. G06g 7/78; B64c 19/00
U.S. Cl. 235—150.22 6 Claims

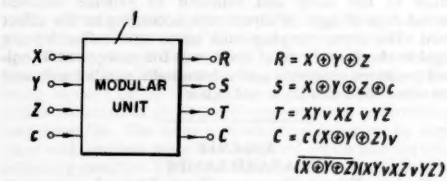


An improved automatic landing control system for aircraft in which the automatic control system flarepath control law parameters includes a normally fixed bias term for establishing a nominal descent rate of the aircraft at touchdown, as well as a term which determines the shape or curvature of the flarepath. Accurate and automatic control of craft airspeed in accordance with a reference airspeed is provided. The dispersion of the touchdown point along the runway caused by uncontrollable variable errors (such as errors in measuring absolute altitude, errors resulting from aircraft displacement from the glide slope beam at flare initiation, headwinds or tailwinds, and windshear) is greatly reduced by varying, during the glide slope controlled approach and prior to flare initiation, the nominal touchdown bias term as a function of the reference airspeed of the aircraft, or alternatively, to vary the flare time constant or path curvature term as a function of airmass flightpath angle and the touchdown bias term as a function of both flightpath angle and reference airspeed.

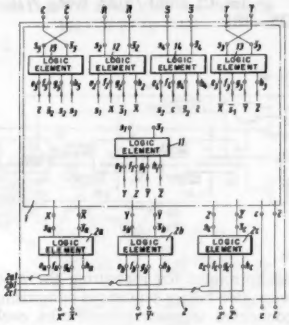
3,604,909
MODULAR UNIT FOR DIGITAL ARITHMETIC SYSTEMS

Heinz Vogel, and Hubert Eing, both of Konstanz, Germany, assignors to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm/Danube, Germany

Filed May 24, 1968, Ser. No. 731,806
Claims priority, application Germany, May 24, 1967, T-33931
Int. Cl. G06f 7/50, 7/52
U.S. Cl. 235—175 7 Claims



A modular logic unit consisting of a plurality of identical logic elements interconnected to perform a large variety of arithmetic operations which fully utilize the logic elements so as to make efficient use of the logic elements and to maintain the cost of such unit at a minimum. An arithmetic unit composed of a plurality of such modular units and a plurality of

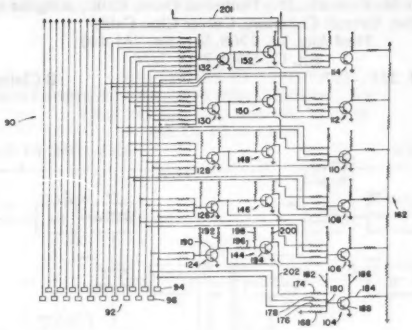


associated storage registers, there being one modular unit associated with each bit location of the storage registers.

3,604,910
PARALLEL COMPARATOR WITH SIMULTANEOUS CARRY GENERATION AND AN ANALOG OUTPUT

Robert W. Kearns, 20424 Rutherford Ave., Detroit, Mich.

Filed Aug. 31, 1967, Ser. No. 664,814
Int. Cl. G06f 7/50
U.S. Cl. 235—177 18 Claims



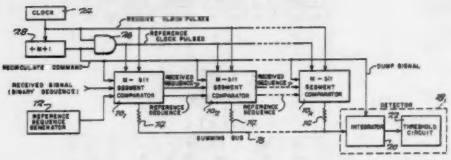
A parallel comparator for digital signals, such as two binary coded numbers, comprising a plurality of parallel carry stages, each having a single semiconductor for receiving input signals representative of all the significant positions in the digital signals up to the particular stage and for providing an output signal in accordance with whether or not a carry output signal is required in the particular stage, an adding stage for each significant position in the signals to be compared, each having a single semiconductor for receiving the input signals in the respective significant position or stage from the input circuits, a carry signal for the respective stage and a carry-not signal from the next significant position or stage from the parallel carry stages, and analog ladder means for receiving the output from the adding stages to provide an analog comparator output signal.

The comparator includes means for providing a direct current or alternating current analog output signal and for varying the output signal in both directions from a zero signal as well as means for limiting the number of input signals to the parallel carry stages.

3,604,911
SERIAL-PARALLEL DIGITAL CORRELATOR

Joseph W. Schmitt, Cheektowaga, N.Y., assignor to Sylvania Electric Products Inc.

Filed May 15, 1969, Ser. No. 824,869
Int. Cl. G06f *15/34*; G06g *7/19*
U.S. Cl. 235—181 8 Claims

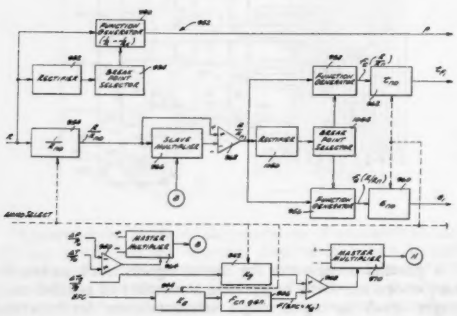


A digital correlator for measuring the amount of agreement between two binary sequences comprising a plurality of cascade-connected segment comparators each operative to serially compare the bits within an M-bit segment of the sequences. A summing bus collects in parallel the comparison output signals of the segment comparators and applies them to a detector comprising an integrator and threshold circuit. Each segment comparator comprises a pair of M-bit shift registers each of which processes bits of a respective one of the binary sequences, a pair of exclusive OR gates for controlling serial loading and recirculation of respective registers, clock drive and feedback connections for recirculating the contents of both registers between the loading of each bit into one of the registers, and a modulo 2 adder for serially comparing the outputs of the registers.

3,604,912
IN-LINE PARTIAL DERIVATIVE MULTIPLIER FOR COMPUTER CIRCUITS

Millard M. Frohock, Jr., Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 21, 1968, Ser. No. 754,440
Int. Cl. G06g *7/28*, *7/16*
U.S. Cl. 235—197 8 Claims

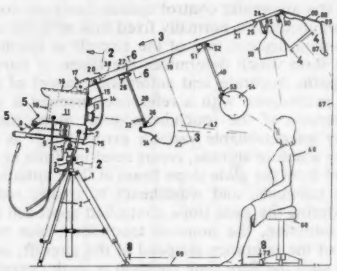


A computer circuit for generating signals related to the ballistics of a plurality of projectile or ammunition types, the signals including time of flight, superelevation, and ballistics drift signals and a circuit including master-slave multipliers for multiplying selected generated signals by partial derivatives corresponding to nonstandard changes in standard conditions. Each slave multiplier includes a first circuit path that directly conducts a signal generated by the computer to a summing circuit and a second circuit path that multiplies the generated signal by the ratio of change in the standard condition to the standard condition and feeds this signal to the summing circuit where it is summed with the generated signal to produce a partial derivative output signal. More specifically, the computer includes a plurality of parallel channels, and a first adjustable operational amplifier which operates on the range information R by a selected ballistics-normalizing transfer function $1/R_n$ to generate an individual normalized range signal R/R_n for a selected individual one of the plurality of projectile or ammunition types, a first multiplier means for multiplying the normalized range signal received from the operational amplifier by a partial derivative of nonstandard air pressure and temperature, each parallel channel including a function generator coupled to receive and operate on the normalized range signal with a nonlinear transfer function common to the ballistics of all of the projectile types for generating an exponential function signal related to the selected projectiles, and a second adjustable operational amplifier coupled to the function generator for operating on the function signal by a selected individual unnormalizing transfer function for each projectile for generating signals related to the ballistics of the projectile, such as superelevation and time of flight on each channel other multiplier means in each channel are coupled in series circuit relationship to multiply the superelevation signal and the time of flight signal by the partial derivative of nonstandard air temperature and air pressure conditions and by the partial derivative of nonstandard propellant grain temperature and effective full charge to correct for changes in standard conditions.

3,604,913
PHOTOGRAPHIC LIGHTING ASSEMBLY

Richard C. Crete, 16 S. School St., Lodi, Calif.

Filed Feb. 7, 1969, Ser. No. 797,403
Int. Cl. G03b *15/035*
U.S. Cl. 240—1.3 5 Claims



A compact, portable photographic assembly that includes a camera support for supporting a camera in a position with the optical axis of its lens directed generally horizontally to one side of said camera, said support being rotatable about a vertical axis, and supporting the inner end of a relatively long boom in a position projecting laterally outwardly and upwardly from said support with said inner end positioned above said camera, and its outer end spaced above the head of a person to be photographed when such person is on said optical axis. Arms spaced between the inner and outer ends of said boom project laterally oppositely outwardly of said boom, each being swingably connected with said boom at one of their ends and each having a lamp and reflector on its opposite end movably supported thereon for varying the position of the lamp and reflector to provide diffused reflected rays of light or direct rays according to the effect desired. The arms carrying said lamps and reflectors are swingable about said one of their ends for movement to collapsed positions alongside and substantially parallel with said boom when the assembly is not in use.

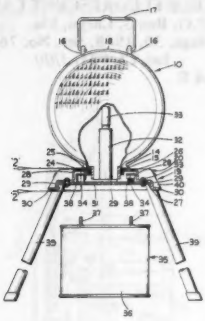
3,604,914
HAZARD LAMPS

Alan Graham Gibson, Burton-on-Trent, England, assignor to The Silvaflame Company Limited, Birmingham, England

Filed Oct. 4, 1968, Ser. No. 765,127
Claims priority, application Great Britain, Oct. 11, 1967, 46382/67
Int. Cl. F21v *5/00*
U.S. Cl. 240—2 R 9 Claims

An electrical hazard lamp is provided which includes a body member serving as a head member for a multilegged

stand and also as a protective cover above a battery. The head member includes an upper wall and a peripheral downwardly extending flange which collectively define a shallow chamber having an open mouth presented downwardly to receive the upper end of a battery supported from the head member. Leg-receiving sockets are formed in the peripheral flange and legs are releasably secured in these



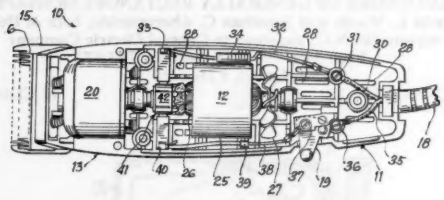
sockets by screws. Alternatively, the legs are irremovably secured in their sockets by rivets arranged to permit the legs to pivot between splayed and compact positions. In the latter arrangement a battery case is releasably attached beneath the head member, the battery case having an outwardly projecting flange which is arranged to constrain the legs releasably in their splayed positions.

3,604,915

ELECTRIC MOTOR APPLIANCE WITH ASSOCIATED LIGHT SOURCE

John F. Wahl, Sterling, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill.

Filed Jan. 15, 1969, Ser. No. 791,413
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 **4 Claims**



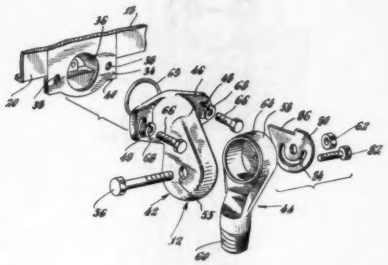
An electric motor appliance with associated lamp energized from a commercial alternating current source of voltage. The appliance shown by way of example is an electric hair clipper. The associated lamp, which illuminates the area being worked on by the appliance, operates at low voltage and is mounted in shockproof manner, both contributing to long lamp life. The lamp is shockproof mounted by engagement with resilient metallized material which also serves as a reflecting member. The appliance employs a permanent magnet motor, and the lamp is connected in parallel with the motor armature, suitable resistance being provided in the armature and lamp circuits to limit the current and voltage to proper values for the lamp. Resilient arcuate conductor lengths mounted on a separable portion of the appliance housing, which also contains the lamp, constitute the connections between the lamp circuit and the motor armature, minimizing assembly cost and facilitating access to the housing interior.

3,604,916

FLOODLIGHT-MOUNTING ARRANGEMENT

Tarek Adra, La Canada, and Robert P. Draper, Burbank, both of, Calif., assignors to Harvey Hubbell Incorporated, Bridgeport, Conn.

Filed Oct. 15, 1968, Ser. No. 767,638
Int. Cl. F21p *5/00*
U.S. Cl. 240—3 **6 Claims**



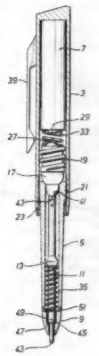
A vertically adjustable floodlight-mounting device including first and second cooperating swivel joint elements is mounted on a horizontally adjustable support and is supportingly secured to the housing of a floodlight to permit the later to be selectively adjusted in a vertical plane. An adjustable mounting plate securing the mounting device to the floodlight housing, permits the housing to be selectively moved relative to the mounting device to thereby alter the relationship between the longitudinal axis of the floodlight and the fixed rotation axis of the swivel joint elements.

3,604,917

BALLPOINT PEN LIGHT

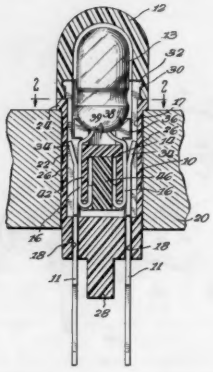
Oron Laverne Schmidt, 8318 Dillon, Houston, Tex.

Filed Jan. 22, 1969, Ser. No. 793,134
Int. Cl. F21u *33/00*
U.S. Cl. 240—6.46 **6 Claims**



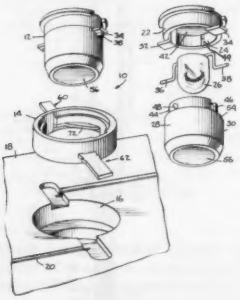
A ballpoint pen construction having self-contained electrical illuminating source and structural couplings whereby the ballpoint cartridge may be extended for use either with or without utilization of the illumination means, thereby conserving the energy in the power source when the pen is in operation and the illumination is unnecessary.

3,604,918
MINIATURE LAMP ASSEMBLY
Arthur Keith Cook, and Edward Fulton, both of Santa Ana, Calif., assignors to Oak Electro/Netics Corp.
Filed Nov. 29, 1968, Ser. No. 779,998
Int. Cl. B60g 3/04
U.S. Cl. 240—8.16 4 Claims



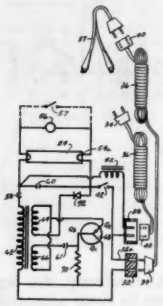
A miniature lamp assembly which includes a replaceable wire lead miniature bulb and a housing having a receptacle for receiving the bulb. A pair of terminal contact members are mounted on the housing with portions thereof exposed within the receptacle. A two-piece bulb base is provided for assembly with the bulb to position and hold the wire leads so that the bulb and bulb base can easily be inserted into the receptacle formed by the housing with the wire leads in engagement with the exposed portions of the terminal contact members.

3,604,919
ILLUMINATION DEVICE FOR EDGELIGHTING TRANSPARENT PANELS
William C. MacPherson, Encinitas, Calif., assignor to Hudson Lamp Company, Kearny, N.J.
Filed July 3, 1969, Ser. No. 838,768
Int. Cl. B60g 3/04; H01r 13/12
U.S. Cl. 240—8.16 16 Claims



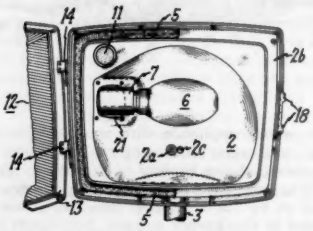
An illumination device includes a lamp assembly enclosing a lamp bulb and providing electrically conductive tabs extending outward from the sidewalls of the lamp assembly and connected in electrical communication with the lamp bulb, and a socket adapted for mounting in a hole in a transparent panel. The socket includes contact spring locking means consisting of a finger portion extending outside of the socket and a bowed spring portion connected to such finger portion and fitting into recesses formed in the inner walls of the socket. The finger portions tightly lock into grooves formed on opposite sides of the panel hole so as to lock the socket in the panel. The lamp assembly is adapted to be inserted into the socket and locked into place by pressing the lamp assembly with its tabs against the socket and rotating such lamp assembly relative to the socket to compress the bowed portion and permit such tabs to pass over center and lock into place in the recesses provided in the socket.

3,604,920
PORTABLE FLUORESCENT LANTERN
Donald M. Niles, P.O. Box 3, Largo, Fla.
Filed Sept. 30, 1968, Ser. No. 763,513
Int. Cl. F21l 3/00
U.S. Cl. 240—11.4 R 5 Claims



A portable fluorescent hand lantern with circuitry for energizing the lantern either on AC or DC power. The lantern is fitted with electrical connectors for respective engagement with female and male sockets of a standard electrical power cord. In AC operation, the female socket of the electric cord is inserted into the lantern and the male socket fits into a standard AC outlet. In DC operation, the power cord is reversed with the male socket of the cord inserted into the lantern and the female socket of the cord connected to a battery adapter. To operate the lantern under DC power, the circuitry includes a transistorized DC to AC power inverter.

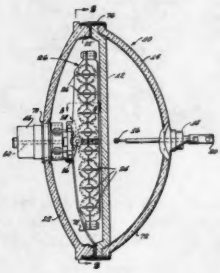
3,604,921
LUMINAIRE OF GENERALLY RECTANGULAR SHAPE
David L. Wood, and Jonathan C. Abercrombie, both of Hendersonville, N.C., assignors to General Electric Company
Filed Aug. 19, 1968, Ser. No. 753,672
Int. Cl. F21s 1/10
U.S. Cl. 240—25 11 Claims



Luminaire of generally rectangular shape adapted to be mounted in vertical or horizontal position for illuminating surfaces at right angles thereto comprises a generally rectangular housing having curved sides and closed by a refractor mounted in a frame which overlaps the rim of the housing and is attached to one side thereof by partially concealed spring metal hinges. The hinges comprise spaced spring plates which are adapted to flex during movement of the frame between closed and open position. On the opposite side, a detent latch holds the frame in closed position. Ribs

on the housing walls serve to hold the luminaire reflector in a downwardly tilted position. The rear wall of the housing is indented at opposite sides to define a slip fitter for mounting the luminaire on a pipe support.

3,604,922
AUTOMOBILE HEADLAMP
John F. Steel, P. O. Box 401, Palm Beach, Fla.
Filed Aug. 20, 1968, Ser. No. 753,991
Int. Cl. F21v *15/02, 17/00*
U.S. Cl. 246—46.07 **10 Claims**

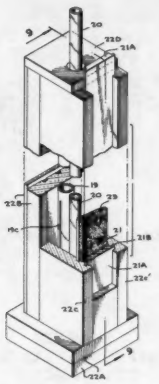


A headlamp has a rear filament compartment and a forward compartment containing parallel louvers. The louvers above the axis are connected by gears near one side of the frame, and those below the axis are connected by gears near the other side of the frame. A transverse shaft, either the motor shaft or a shaft driven by a face gear on the shaft of a motor extending through the lens, carries end gears meshing the gears of the innermost louvers, which are between the motor and filament and prevent direct exposure of the motor to filament heat. Cushion elements prevent physical contact between the glass parts and the louver and motor assembly.

3,604,923
SWIVEL MOUNTING FOR ELECTRICAL APPLIANCE
Dillon W. Moffatt, 727 Winnetka Ave., Golden Valley, Minn.
Filed Dec. 9, 1968, Ser. No. 782,106
Int. Cl. F21v *21/00;* **F16l** *27/00*
U.S. Cl. 240—52 R **13 Claims**

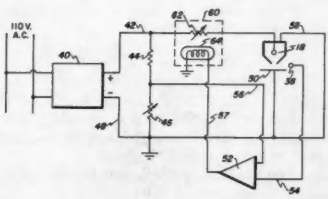
A lamp connected to a support with a flexible arm enclosing an electrical cable. Separate swivel mounts connected to opposite ends of the arm movably attach the arm to the support and to a lampshade. Each swivel mount has a stationary member with a fixed stop and a pair of relatively rotatable members mounted on the stationary member to permit approximately 600° of rotation of the flexible arm relative to the support and approximately 600° of rotation of the lampshade relative to the arm.

3,604,924
AUTOMATIC SEDIMENTATION RATE RECORDER
Adrian W. Standaart, 5 Bonbrook Circle, Winston-Salem, N.C.
Continuation-in-part of application Ser. No. 828,209, May 27, 1969, now abandoned. This application Sept. 24, 1969, Ser. No. 864,943
Int. Cl. G01n *33/16*
U.S. Cl. 346—33 ME **34 Claims**



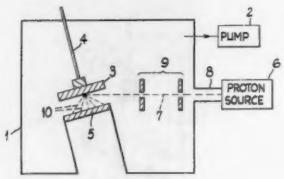
An automatic sedimentation rate recording apparatus wherein an elongated container tube containing a fluid sample is placed in a holder adjacent an elongated record forming strip and a high-intensity flashlamp, and a solid state timer circuit times out a selected test period, for example, of 1 hour, activates the flashlamp to produce in the record forming strip an image indicating the level of the sediment in the container tube, and an indicator lamp is activated to signal completion of the test and recording.

3,604,925
APPARATUS FOR CONTROLLING THE AMOUNT OF CHARGE APPLIED TO A SURFACE
Christopher Snelling, Penfield, and Norman R. La Fond, Webster, both of, N.Y., assignors to Zerox Corporation, Rochester, N.Y.
Filed Dec. 3, 1968, Ser. No. 780,811
Int. Cl. G03g *13/00*
U.S. Cl. 250—49.5 ZC **4 Claims**



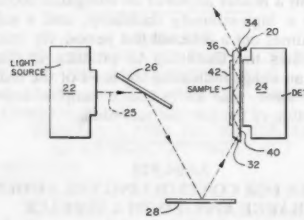
Apparatus for automatically controlling the amount of electrostatic charge applied to a plate by controlling the potential applied to a corona wire.

3,604,926
MAGNIFYING DEVICES FOR OBSERVING CRYSTAL LATTICE STRUCTURES
Richard Stuart Nelson, Goring-on-Thames, England, assignor to United Kingdom Atomic Energy Authority, London, England
Filed Dec. 11, 1967, Ser. No. 689,659
Claims priority, application Great Britain, Dec. 14, 1966, 56,081/66
Int. Cl. H01j *37/26*
U.S. Cl. 250—49.5 **1 Claim**



A collimated beam of protons is directed at an area on the surface of a specimen and the backscattered protons are used to produce a magnified image of the area. The image may be produced by arranging a fluorescent screen in the path of the scattered protons.

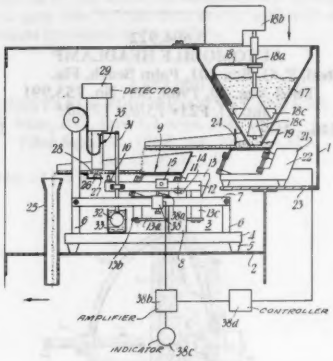
3,604,927
TOTAL REFLECTION FLUORESCENCE SPECTROSCOPY
Tomas Hirschfeld, Thousand Oaks, Calif., assignor to Block Engineering, Inc., Cambridge, Mass.
Filed Nov. 16, 1966, Ser. No. 594,860
Int. Cl. G01n *21/52*
U.S. Cl. 250—71 R **5 Claims**



A fluorescence spectroscopic device and method of using an attenuated, total, multiple reflection slab on one surface of which a sample is placed. A beam of fluorescence-exciting radiation is passed through the slab by multiple reflections. A detector is located alongside the slab and out of the path of any of the exciting radiation to pick up fluorescent emission passing through the cell and across the path of the exciting radiation. The slab thereby serves as a no-loss secondary filter with respect to the fluorescence, permitting the latter to be easily distinguishable from the exciting radiation even where the wavelengths are similar.

3,604,928
APPARATUS FOR TESTING AND REGULATING THE FLOW OF POWDERED MATERIAL
Peter Edward Starnes, Reading, England, assignor to Hilger & Watts Limited, London, England
Filed Mar. 21, 1968, Ser. No. 714,878
Int. Cl. G01n *23/12*
U.S. Cl. 250—43.5 **8 Claims**

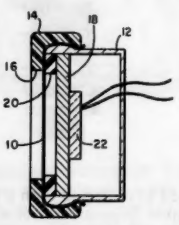
Apparatus for testing powdered sample material by radiometric analysis including a sample carrier in the form of a vibratory conveyor, means for forming a layer or ribbon of powdered sample material on said carrier of continuously measured and substantially constant mass per unit area and substantially constant thickness and width, a source of radiation past which said sample layer can be moved by the carrier at a substantially constant distance from said source so as to be irradiated thereby and means for measuring the resultant radiations emanating from the sample material.



3,604,929
PROCESS FOR THE DETECTION AND MEASUREMENT OF IONIZING RADIATION BY THE USE OF RADIATION-DEGRADEABLE MATERIAL
Jean-Paul Lucien Goulin, Vincennes, France, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 17, 1969, Ser. No. 799,878
Claims priority, application France, Mar. 5, 1968, 142344/68
Int. Cl. G01t *5/00, 5/10*
U.S. Cl. 250—83 **17 Claims**

Radiation-degradeable film, a portion of which has been irradiated, is treated initially with a basic solution, containing a chemical reagent which swells the material constituting the film, making it possible for the basic solution to attack the radiation degraded parts more deeply. Also, in a further operation the film may be treated with a solvent which dissolves surface roughness formed during the initial treatment so that the nondegraded parts recover their initial transparency while the more deeply attacked degraded parts remain visible. This method lends itself to automatic dosimetry in which the optical densities of irradiated and nonirradiated portions of the material are compared.

3,604,930
METHOD AND APPARATUS FOR DISPLAYING VISUAL IMAGES OF INFRARED BEAMS
Philips J. Allen, Washington, D.C.
Filed Mar. 5, 1970, Ser. No. 16,887
Int. Cl. G01n *21/00*
U.S. Cl. 250—83 R **3 Claims**



A method and device for displaying a visual pattern of an incident beam of infrared radiation includes a film of minute droplets of a liquid crystal composition encapsulated in gelatin. The nature of the composition is such that within a certain temperature range its optical properties change with

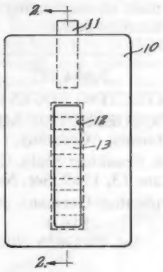
a change of temperature so that it appears to change color. The film of liquid crystal is thermally biased to its critical temperature so that when incident infrared radiation is absorbed by the composition, the temperature thereof is raised which causes a color change in the zone of the film on which the radiation is incident.

3,604,931

NEUTRON DOSIMETER INCLUDING A STEP WEDGE FORMED OF AN ALPHA-ATTENUATING MATERIAL

Jacob Kastner, Downers Grove, and Billie G. Oltman, Worth, both of, Ill., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 10, 1969, Ser. No. 883,737
Int. Cl. G01t *3/02*
U.S. Cl. 250—83.1 R **4 Claims**



A neutron dosimeter includes a material which emits alpha particles when bombarded with neutrons, a plastic foil in position to intercept these alpha particles and a step wedge of a material, capable of attenuating the alpha particles, disposed between the alpha-emitting material and the plastic foil. The step wedge varies from zero thickness to such a thickness as will attenuate the most energetic alpha particles formed in the dosimeter to particles having an energy such that the particles form tracks in the plastic foil. Following exposure to neutrons the plastic foil is etched to expose the alpha tracks in the plastic. The location of the tracks in the plastic indicates the energy of the neutrons and the total number of tracks in the plastic indicates the intensity of the neutron flux.

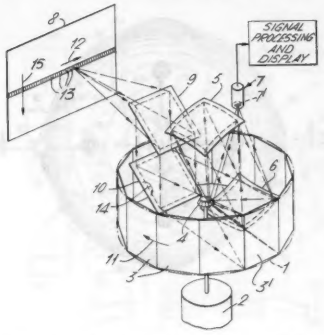
3,604,932

INFRARED OPTICAL SCANNING SYSTEM COMPRISING A ROTATABLE FACETED MIRROR HAVING INCLINED FACETS

Allan David Beach, Newbury, England, assignor to National Research Development Corporation, London, England

Filed Feb. 27, 1970, Ser. No. 15,117
Claims priority, application Great Britain, Feb. 28, 1969, May 8, 1969, 11007/69;23624/69
Int. Cl. G01j *1/04;* **G02b** *17/00*
U.S. Cl. 250—83.3 H **11 Claims**

An optical scanning system incorporates a rotatable faceted mirror with facets inclined to the rotation axis. The mirror is arranged substantially centrally with respect to a ring of imaging elements, e.g. concave mirrors, with one imaging element corresponding to each facet. The imaging elements are rotated synchronously with the faceted mirror so that each in turn is operative in conjunction with the corresponding facet to effect a line scan, the optical path extending from the faceted mirror parallel to the rotation axis towards a detector or a light source, preferably via a fixed optical relay system. The scanning system is particularly applicable to infrared thermography, and for this purpose may



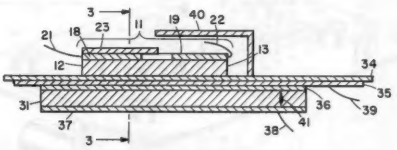
incorporate self-calibrating arrangements utilizing internal radiation sources.

3,604,933

ELECTROMAGNETIC RADIATION-DETECTION DEVICE COMPRISING FERROELECTRIC SENSING, REFERENCE AND TEMPERATURE-STABILIZING COMPONENTS

Leslie E. Cross, and Eugene P. Lunghofer, both of State College, Pa., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Jan. 8, 1969, Ser. No. 789,815
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 **21 Claims**



An electromagnetic radiation detection device having increased sensitivity comprises ferroelectric crystalline sensing and reference components, temperature stabilized with a ferroelectric TANDEL at a temperature near a crystallographic transition temperature of the ferroelectric crystalline material used. The device has wide application wherever sensitive electromagnetic radiation detectors are required. Two embodiments are described having varying complexity and sensitivity.

3,604,934

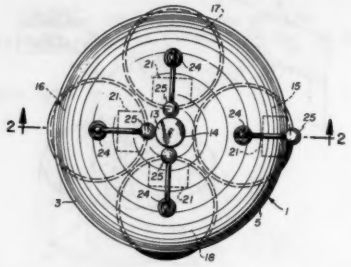
APPARATUS FOR RADIOACTIVE IRRADIATION OF SAMPLE MATERIALS

Anthony P. Melillo, West Orange, and John E. Corea, Livingston, both of, N.J., assignors to Radiation Resources, Inc., Fairfield, N.J.

Filed Sept. 10, 1968, Ser. No. 758,897
Int. Cl. G21h *5/00*
U.S. Cl. 250—106 **1 Claim**

Apparatus for the irradiation of sample materials with radioactive radiation comprising a housing containing a substantially centrally located cavity containing radioactive material, a plurality of horizontally disposed cylindrical passages each having a vertical axis and communicating with the central cavity, the passages being spaced from each other

about the central cavity, each passage containing a coaxial cylindrical rotatable carrier therein, the carrier having a seat for containing a sample to be irradiated, the seat being recessed into the peripheral wall of the carrier, each seat



being horizontally registrable with the central cavity upon rotation of the carrier, thereby permitting a plurality of the carrier seats to be simultaneously or selectively exposable to the source of radiation.

3,604,935

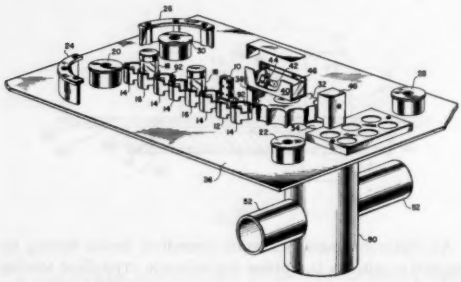
SIGNALLING MEMBER AND METHOD FOR PROGRAMMING AUTOMATIC RADIOACTIVITY-MEASURING SYSTEM

Roy E. Nather, Salano Beach, Calif., assignor to Beckman Instruments, Inc.

Continuation of application Ser. No. 541,674, Apr. 11, 1966, now abandoned. This application Apr. 1, 1969, Ser. No. 812,457

Int. Cl. G01t *1/17, 7/02*

U.S. Cl. 250—106 **4 Claims**



Apparatus and method for coding commands on a pseudosample signaling member (control tower) which may be sensed and used to alter the program of an automatic radioactivity measuring system for the following samples. The signaling member is placed in the sample conveyor. It may also direct functions such as group reject.

3,604,936

OPTICAL TIME DIVISION SWITCHING SYSTEM

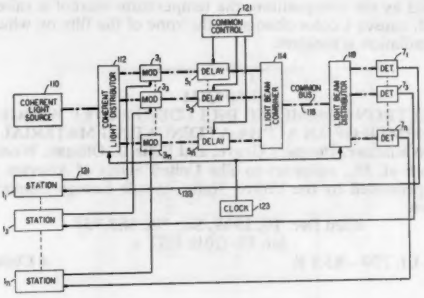
Rudolf Kompfner, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 20, 1968, Ser. No. 754,010

Int. Cl. H04b *9/00*

U.S. Cl. 250—199 **13 Claims**

An optical time division switching system is described in which coherent light from a laser is successively applied to a group of modulators controlled by electrical signals from corresponding stations. The light from each modulator is selectively delayed for transmission to another station in the group and then sequentially combined into a single light beam. This light beam is applied to a group of detectors wherein the light is successively demodulated in accordance with the selective-



ly delay sequence. The electrical signals from each detector are connected to their corresponding stations to complete the desired communication paths.

3,604,937

DEVICE FOR DETECTING EDGES OR A PATTERN BY PHOTOELECTRIC MEANS

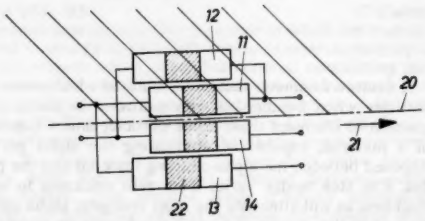
Gunter Hahn, Hausen, Germany, assignor to Messer Griesheim GmbH, Frankfurt/Main, Germany

Filed June 13, 1969, Ser. No. 832,909

Claims priority, application Germany, June 15, 1968, P 17 63 516.4

Int. Cl. G05b *1/00*

U.S. Cl. 250—202 **8 Claims**



In an apparatus for photoelectrically following up an edge portion or a pattern for controlling a processing machine such as a cutting apparatus, a bridge circuit comprising at least four branches having a light-sensitive resistor included in each of the branches, one pair of the light-sensitive resistors being disposed on a dark region on one side of the edge portion or pattern, another pair of the light-sensitive resistors being disposed on a bright region on the other side of the edge portion or pattern, the light-sensitive resistors having similar characteristics.

3,604,938

METHOD FOR OPERATING ELECTROLUMINESCENCE DISPLAY DEVICE

Tadao Kohashi, Yokohama, and Kazunobu Tanaka, Kawasaki-shi, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

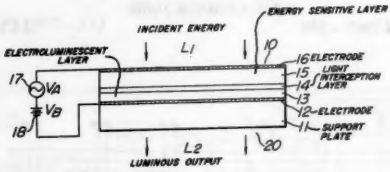
Continuation of application Ser. No. 618,380, Feb. 24, 1967, now abandoned. This application Apr. 29, 1969, Ser. No. 820,136

Int. Cl. H01l *17/00*

U.S. Cl. 250—213 R **13 Claims**

A method of operating an electroluminescent display device in which a unidirectional electric field of a predeter-

mined direction is established across an electroluminescent layer comprising electroluminescent phosphor and glass enamel thereby to control the luminescence of said electroluminescent layer caused by excitation with an AC electric field.

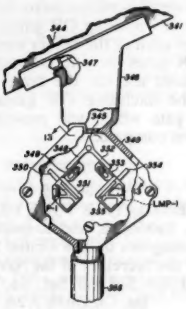


3,604,939

TONER CONCENTRATION SENSING APPARATUS HAVING PLURAL SENSORS AND A FLOW CONTROL MEANS FOR EACH SENSOR

John Maksymiak, Penfield, and Salvatore Latone, Rochester, both of, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed May 24, 1968, Ser. No. 731,756
Int. Cl. G01f 11/00; G01n 21/22; G03g 13/00
U.S. Cl. 250—218 **3 Claims**



A toner concentration sensing apparatus arranged in the circulation path of developing material in an electrostatic reproduction machine and having a housing into which some of the moving developing material is diverted. The apparatus includes means in the housing or splitting the inflowing material into a plurality of paths each of which has associated therewith a toner concentration sensing device all of which cooperate with a toner replenishing means. A timing mechanism is connected to the sensing devices for periodically controlling their operation as toner concentration sensing devices.

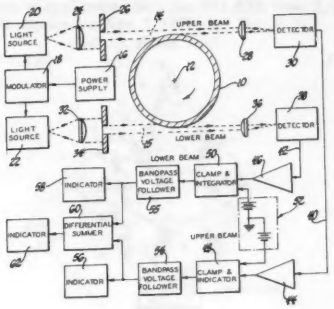
3,604,940

RADIANT ENERGY INSPECTION SYSTEM FOR ROTATING OBJECTS

David R. Matthews, Ann Arbor, Mich., assignor to Laser Systems Corporation, Ann Arbor, Mich.

Filed Aug. 4, 1969, Ser. No. 847,109
Int. Cl. G01b 7/12
U.S. Cl. 250—219 S **10 Claims**

Radiant energy inspection system for rotating objects including means for directing parallel light beams tangentially along diametrically opposite surface locations of the object, each beam being partially intercepted in accordance with the radial displacements of the object surface relative to the beams. Geometric qualities of the object are determined by producing signals representing the unintercepted beam portions and comparing the signals with one another in a predetermined algebraic frame of reference. Eccentricity is indicated by in-phase signal variations while surface irregularities are indicated by phase shifted signal variations. Diameter is indicated by the algebraic difference between the signals.

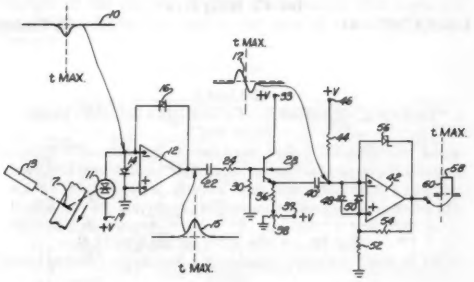


3,604,941

SYSTEM FOR SENSING INDICIA ON MOVING MEMBERS

James N. Crum, Stonington, Conn., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Nov. 18, 1969, Ser. No. 877,700
Int. Cl. G08c 9/06
U.S. Cl. 250—219 **8 Claims**

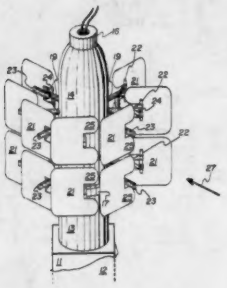


A system for sensing a register mark, or other indicia, which, for example, may be associated with a high-speed web-fed printing press, provides a signal which indicates the passage of the register mark past a conventional sensor. The signal from a conventional amplifier coupled to the sensor is coupled through an operational amplifier that has a varistor connected between its inverting input and its output to an emitter-follower circuit that has a threshold adjustment resistor in its emitter path to ground. The output of the emitter-follower circuit is coupled to an RC differentiating circuit and the differentiating circuit is coupled to a second operational amplifier. The second operational amplifier has a Zener diode connected between its inverting input and its output and it produces an output voltage which is close to ground when the differentiated signal is of one polarity and an output pulse signal which is independent of width of the sensed signal, and which occurs essentially simultaneously with the occurrence of a peak magnitude of the sensed signal which is provided by the conventional sensor-amplifier combination, when the differentiated signal changes to the other polarity.

3,604,942
UNDERWATER GENERATOR

Curtis A. Nelson, 139-B Poinsettia Court, Chula Vista, Calif.

Filed May 11, 1970, Ser. No. 36,093
Int. Cl. F03b *13/10*
U.S. Cl. 290—54 R 1 Claim

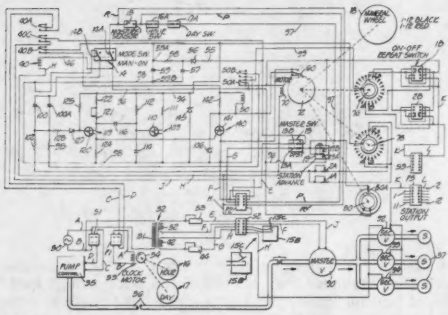


An underwater generator having an outside sealed stator mounted to a concrete base which, in turn, is anchored in a river bottom; a rotor rotatably carried by said stator by a plurality of bearing races, and a plurality of radially extending arms, each arm pivotally carrying a paddle, each paddle having a geometry operable for opening with water current and closing against water current.

3,604,943
SPRINKLER SYSTEMS AND VARIABLE TIMING MEANS

Donald R. Bayer, Claremont, and Gary R. Lachman, Glendora, both of, Calif., assignors to Clemar Manufacturing Corporation

Filed Feb. 26, 1970, Ser. No. 14,342
Int. Cl. H02j *3/14*
U.S. Cl. 307—41 20 Claims

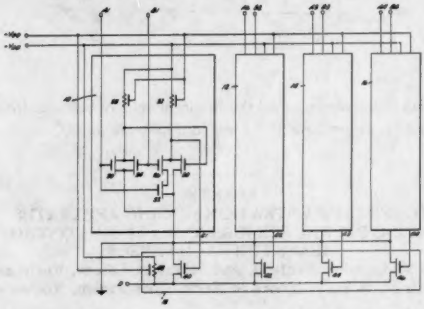


A programming system involving automatic water sprinkling in which one of a plurality of resistances is automatically selected for insertion in the RC (resistance-capacitance) frequency-determining circuit of a relaxation oscillator. The oscillator after a time delay established by the selected resistance, causes a motor to rotate a plurality of selected switches, one of which selects a different resistance and another of which selects a different watering station. Manual override is provided. Means involving an On-Off-Repeat switch allows a selected watering station to correspondingly be (1) included once in the program, (2) excluded from the program or (3) included for a second time (repeat) without regard to particular time of day. Means are provided to prevent a watering operation at a station when the ground at that station is sufficiently moist.

3,604,944
MOSFET COMPARATOR CIRCUIT

James L. Gundersen, Carson, and Stephen P. F. Ma, Santa Monica, both of, Calif., assignors to Hughes Aircraft Company, Culver city, Calif.

Filed Apr. 9, 1970, Ser. No. 27,081
Int. Cl. H03k *19/08*
U.S. Cl. 307—205 3 Claims

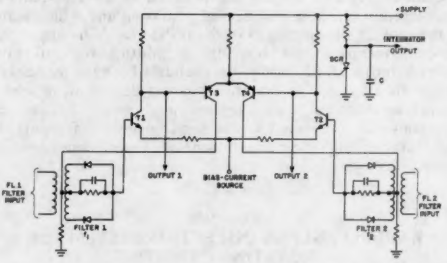


A metal oxide semiconductor field-effect transistor (MOSFET) digital comparator circuit of a type that can be constructed on a single semiconductor substrate. The circuit includes a series of exclusive OR gates, each of which accepts one bit from each of the binary words being compared. The exclusive OR gates provide an output signal when the bits being compared are not the same. The output signals from each of the exclusive OR gates are applied to a MOSFET NOR gate which will provide an output signal when all of the bits compare.

3,604,945
REGENERATIVE TONE DECODER

Eric J. Hoffman, Baltimore, and Reginald M. Rhue, Laurel, both of, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Nov. 5, 1968, Ser. No. 773,572
Int. Cl. H03k *3/26*
U.S. Cl. 307—233 6 Claims



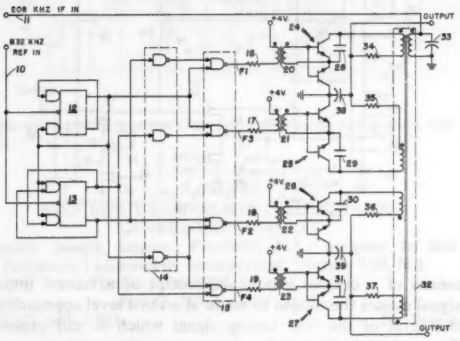
For a spacecraft command system, a tone decoder which distinguishes between binary zeros and ones. The circuit combines the operations of a differential amplifier, a threshold detector, a Schmitt trigger and a fast-reset integrator in a single circuit which uses fewer components than would be required if these operations were cascaded, as in the prior art.

3,604,946

DUTY-CYCLE PHASE DETECTOR

Edward F. Prozeller, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 28, 1969, Ser. No. 819,902
Int. Cl. H03k 5/20
U.S. Cl. 307—232 5 Claims



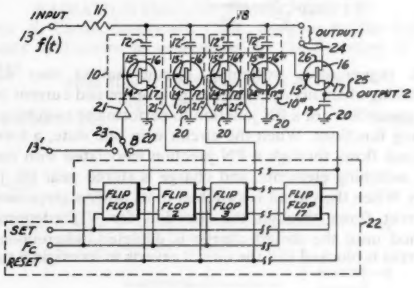
A phase detector circuit in which the rectifying elements conduct for a fraction of the reference period and therein determine the relative phase difference between an unknown input signal and a reference signal. This is primarily accomplished by obtaining from the reference signal switching functions that are of fractional duty cycle as compared to the unknown signal. The output of this fractional duty cycle phase detector is a DC voltage whose level is proportional to the phase difference between the reference and the unknown input signal.

3,604,947

VARIABLE FILTER DEVICE

Steven H. Puthuff, San Diego, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Continuation-in-part of application Ser. No. 661,093, Aug. 16, 1967, which is a continuation-in-part of application Ser. No. 504,032, Oct. 23, 1965, now abandoned. This application June 24, 1969, Ser. No. 843,900
Int. Cl. H03k 5/20
U.S. Cl. 307—233 6 Claims



The present invention relates to electrical circuit apparatus capable of providing sampled integration of an electric signal.

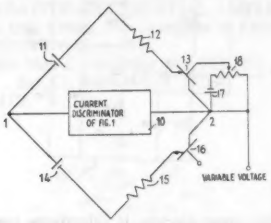
According to the present invention, an integrator filter is provided having at least one capacitor stage. Each stage includes a capacitor in series with an electronic switch, such as a field-effect transistor capable of being switched at a desired frequency.

3,604,948

SAFETY DISCRIMINATOR DEVICE

Jacques Dutilloeil, and Joseph Claes, both of Mont-sur-Marchienne, Belgium, assignors to Ateliers De Constructions Electriques De Charleroi (ACEC), Societe Anonyome, Charleroi, Belgium

Continuation of application Ser. No. 591,533, Nov. 2, 1966. This application Apr. 7, 1970, Ser. No. 26,267
Int. Cl. H03k 5/20
U.S. Cl. 307—235 1 Claim



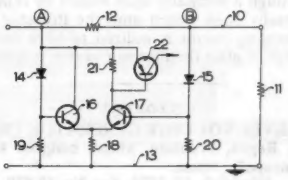
A discriminator device for detecting if a current or a voltage is below or above a predetermined threshold which includes an amplification element having first and second main electrodes and a control electrode, and a DC power source connected between the main electrodes of the amplification element. An alternating current generator is connected between one pole of the power source and the first main electrode, and an alternating current detector is connected between the other pole of the power source and the second main electrode, said detector being sensitive to an alternating current having an intensity above a predetermined level. In addition, an input circuit is connected to the control electrode of the amplification element and this input circuit includes means for generating a DC voltage drop for biasing the amplification element which is independent of the strength of the current flowing therethrough, this input circuit being adapted to control the gain of the amplification element.

3,604,949

MONITORING CIRCUITS FOR DIRECT CURRENT CIRCUITS

Gerhard Conzelmann, Leinfelden; Adolf Kugelmann, Leonberg; Heinz Moller, Stuttgart; Heinz Kammerer, Nellingen; Karl-Ernst Boeters, Berlin, and Hans-Joachim Fleischer, Berlin, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed June 18, 1970, Ser. No. 47,516
Claims priority, application Germany, June 18, 1969, P 19 30 753.0
Int. Cl. H03k 5/20
U.S. Cl. 307—235 20 Claims

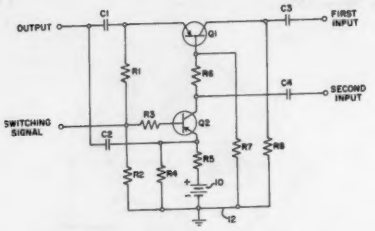


The voltage drop across a control resistor in the monitored direct current circuit, which drop varies in accordance with the condition of the direct current load, affects the amount of current through a differential amplifier and causes operation of a transistor switch in one of the two collector circuits of the amplifier whenever the load current changes sufficiently. The switch controls an indicating device.

3,604,950
SWITCHING CIRCUIT

Melvin T. Anderson, Forest, and James E. Luth, Lynchburg, both of, Va., assignors to General Electric Company

Filed May 7, 1969, Ser. No. 822,444
Int. Cl. H03k 17/00
U.S. Cl. 307—243 2 Claims

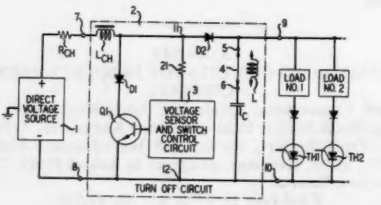


One of two input circuits is selectively connected to an output circuit through first and second PNP-type transistors. Normally, the first transistor is turned off and the second transistor is turned on to disconnect the first input circuit from the output circuit, and to connect the second input circuit to the output circuit. The first transistor can be turned on and the second transistor can be turned off by a switching signal to connect the first input circuit to the output circuit, and to disconnect the second input circuit from the output circuit.

3,604,951
THYRISTOR SWITCH TURNOFF CIRCUIT

Frank J. Zgebura, Whippany, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, Berkeley Heights, N.J.

Filed Dec. 27, 1968, Ser. No. 787,375
Int. Cl. H03k 17/00, 17/56
U.S. Cl. 307—252 9 Claims



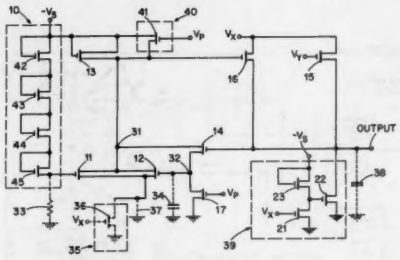
Thyristor switches, which are normally reopened by a resonant turnoff circuit, may become permanently conductive (latched on) under gamma radiation. This invention senses the latch-on condition and bypasses current from the thyristor through a normally open switch by repeatedly closing the normally open switch until the thyristor recovers. A resonant charging circuit is utilized to very rapidly restore normal operation after the thyristor switch recovers.

3,604,952
TRI-LEVEL VOLTAGE GENERATOR CIRCUIT

William M. Regitz, Franklin, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 12, 1970, Ser. No. 10,829
Int. Cl. H03k 5/01
U.S. Cl. 307—264 19 Claims

Herein is revealed an adaptive tri-level voltage generator circuit which may be used with a random access memory cell and which circuit employs transistors preferably of the silicon gate or MOS (metal oxide semiconductor) field effect type. The illustrated embodiment employs a feedback subcircuit arrangement wherein a feedback controllable voltage is established in the feedback loop. Timing signals are received in a fixed relationship so that initially a first voltage level is established on the circuit's output line. An intermediate voltage level is established on the output line upon receipt of a first timing signal activating the feedback subcircuit to lower the feedback voltage. Such intermediate voltage is determined by the voltage drops in a feedback subcircuit. By

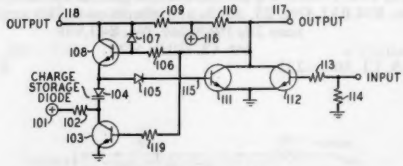


means of a control subcircuit, receipt of a second timing signal causes the output to settle at a third level approaching the level of the first timing signal which is still present. Removal of the first timing signal causes the output to return to its initial level. The intermediate voltage adapts to changes in the threshold voltage of transistors included in the feedback subcircuit.

3,604,953
REGENERATIVE SWITCHING CIRCUITS USING THE CHARGE STORAGE CHARACTERISTICS OF PN JUNCTIONS TO PERFORM THE SWITCHING AND TIMING FUNCTIONS

Philip M. Carmody, Roselle Park, and Dennis J. Lynes, Madison, both of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 15, 1969, Ser. No. 824,991
Int. Cl. H03k 3/26
U.S. Cl. 307—273 10 Claims



A regenerative switching circuit having two active switching elements uses the charge storage and current limiting capabilities of a PN junction to perform the switching and timing functions. When the circuit is in one state, a forward current flows through a PN junction associated with one of the switching elements, and charge is stored near the junction. When the circuit is switched to its other state, a reverse current flows through the junction for a predetermined period until the stored charge is depleted, whereupon the current is blocked and the circuit reverts to its original state.

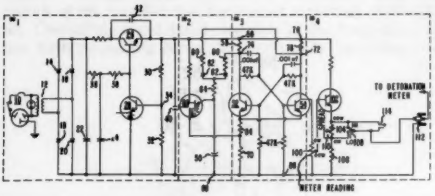
3,604,954
TRANSISTORIZED KNOCK SIGNAL GENERATOR

Joe Turner May, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

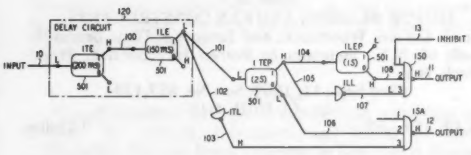
Filed Oct. 26, 1967, Ser. No. 678,318
Int. Cl. H03k 5/02
U.S. Cl. 307—264 1 Claim

Improved electronic wave signal generator having one or more variable attenuating means for converting fixed voltage

square waves to variable voltage magnitude square waves especially useful in checking and calibrating detonation meters.

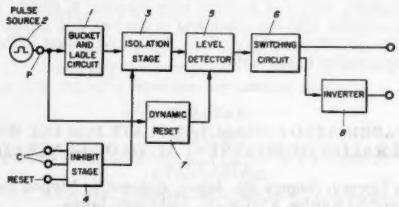


3,604,955
STEP INPUT RESPONSIVE OUTPUT PULSE GENERATION CIRCUIT
Ronald Joseph Angner, Freehold, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.
Filed Feb. 26, 1970, Ser. No. 14,451
Int. Cl. H03k *17/28, 1/18*
U.S. Cl. 307—293 **16 Claims**



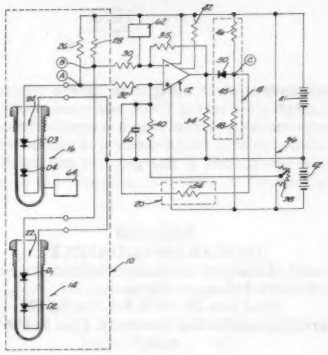
A group of timers, each having the characteristic of providing an immediate output voltage translation when an input goes from low to high and providing a delayed output voltage translation when the input goes from high to low, are arranged to detect the leading and trailing edges of a step input and to generate a step function having leading and trailing edges independently delayed from the respective leading and trailing edges of the detected step input. The delayed step function is supplied to another group of timers arranged to provide individually controllable pulse outputs in coincidence with the leading and trailing edges of the delayed step function.

3,604,956
RADIATION IMMUNE TIMING CIRCUIT
Walter A. Cooke, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Navy
Filed July 1, 1969, Ser. No. 838,168
Int. Cl. H03k *17/28*
U.S. Cl. 307—293 **8 Claims**



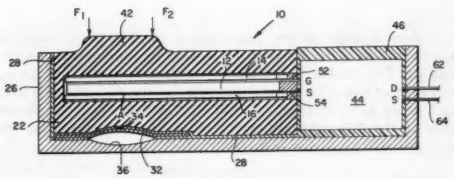
An interval-timing circuit which remains accurate after being subjected to a transient radiation impulse. The circuit includes a bucket and ladle integrating network for converting digital timing pulses to an analog voltage signal. The analog voltage signal is converted to a current signal by an isolation circuit and is then passed to a current level detector which generates an output when the current signal reaches a predetermined magnitude. A dynamic resetting circuit is coupled to the current level detector to prevent the generation of a premature response due to false activation of the level detector by a transient radiation impulse.

3,604,957
TEMPERATURE MEASUREMENT HAVING SENSOR AND REFERENCE DIODES AT INPUTS OF REGENERATIVE DIFFERENTIAL AMPLIFIER
Otto G. Satula, Oak Creek, Wis., assignor to Electronic Construction Corp., Milwaukee, Wis.
Filed May 2, 1969, Ser. No. 821,351
Int. Cl. H03k *17/14, 17/74*
U.S. Cl. 307—310 **5 Claims**



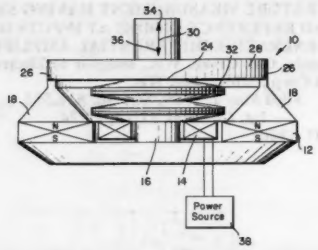
A differential-temperature-sensing system including a temperature-sensing network having a linear voltage drop characteristic to provide a differential voltage input signal to an amplifier which is balanced to provide a set output voltage when the differential input voltage is zero and a monitoring network having a feedback circuit connected to the amplifier input to trigger the amplifier in response to a change in the set output voltage.

3,604,958
SENSING TRANSDUCER
Oscar Palini, Camp Springs, Md., assignor to U.S. Research Corporation, Washington, D.C.
Filed May 14, 1970, Ser. No. 37,111
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.1 **18 Claims**



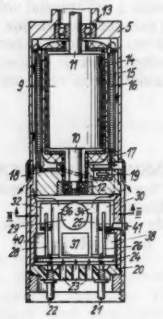
An improved sensing transducer for use in a security device to protect objects from unauthorized removal is designed to sense both increases and decreases in pressure and to provide an output signal indicating that a pressure change has occurred. The sensing transducer includes a piezoelectric element and an actuator for transmitting pressure to the piezoelectric element to provide two different types of stress in the element. When an increase or decrease in pressure occurs, the piezoelectric element produces an output signal to indicate a change in pressure.

3,604,959
LINEAR MOTION ELECTROMECHANICAL DEVICE UTILIZING NONLINEAR ELEMENTS
Oded E. Sturman, Arleta, Calif., assignor to Fema Corporation, Pacoima, Calif.
Filed Dec. 15, 1969, Ser. No. 885,098
Int. Cl. H02k *33/16*
U.S. Cl. 310—12 10 Claims



A linear motion electromagnetic device has a nonlinear spring to establish a spring force armature position characteristic proportionally opposite to a magnetic force armature position characteristic established by a permanent magnet. An electromagnetic coil is energized to control the position of the armature.

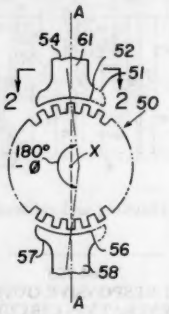
3,604,960
DENTAL DRILL HANDLE
Erich Krestel, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany
Filed Jan. 26, 1970, Ser. No. 5,817
Claims priority, application Germany, Feb. 5, 1969, P 19 05 624.7
Int. Cl. H02k *7/14*
U.S. Cl. 310—50 8 Claims



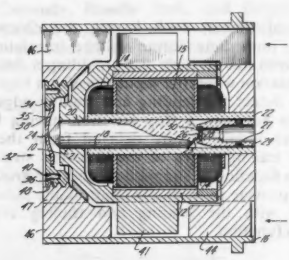
A dental drill handle has a small electric direct-current motor located in the handle and driven by an electronic commutator. The motor is cooled by compressed air. The structural part of the electronic commutator are all located within the handle in such manner that they are at least partly exposed to the flow of compressed air used for cooling the motor.

3,604,961
DIRECT CURRENT MOTOR HAVING POLES ARRANGED TO MINIMIZE COGGING TORQUE
Neil Saldinger, Woodland Hills, Calif., assignor to Vernitron Corporation, Great Neck, N.Y.
Filed Feb. 26, 1970, Ser. No. 14,464
Int. Cl. H02k *5/24*, *23/04*
U.S. Cl. 310—51 3 Claims

A direct current motor has a rotatable axially slotted cylindrical armature and an even number of permanent magnet poles. The poles are spaced apart 360°/N where N is the number of poles. The poles can be asymmetrically shaped so that the points of maximum field strength of each pole are spaced 360°/N ±Φ from each adjacent pole to effect cooperative cancellation of cogging torque tending to be generated between the armature and the respective adjacent poles.



3,604,962
MOTOR BEARING AND FAN CONSTRUCTION
John C. Larson, Woodstock, and Jacques J. Desy, Bearsville, both of, N.Y., assignors to Rotron Incorporated, Woodstock, N.Y.
Filed Sept. 11, 1969, Ser. No. 857,128
Int. Cl. H02k *5/16*
U.S. Cl. 310—67 7 Claims

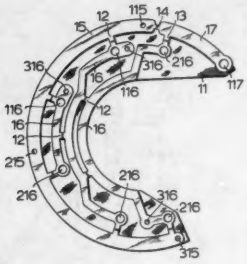


An electric motor in accordance with the invention disclosed herein comprises a stator coaxial with and separated from a rotor by a radial or journal bearing arrangement including a pin rotatably received in a sleeve. One end of the pin comprises a thrust face which bears against a thrust bearing to prevent axial movement of the motor, In one embodiment, the thrust face is convex and the thrust bearing is a flat jewel or plastic member. In another embodiment, the thrust face is flat and the thrust bearing is a spherical jewel. In still another embodiment, the thrust face is concave and the thrust bearing is a spherical jewel. For taking up axial play, an adjustably mounted resilient plug member is moved into close proximity with the other end of the pin. Fan blades are mounted on the periphery of the rotor and rotate within a housing coupled to the stator.

3,604,963
PREFABRICATED CONNECTOR PLATE FOR USE WITH A PLURALITY OF DIFFERENT AC TO DC GENERATOR CIRCUITS
Yasuo Tawara, Nagoya shi, Japan, assignor to Nippon Denso Kabushiki Kaisha, Kariga-shi, Aichi-ken, Japan
Filed Nov. 26, 1969, Ser. No. 880,231
Int. Cl. H02k *11/00*
U.S. Cl. 310—68 17 Claims

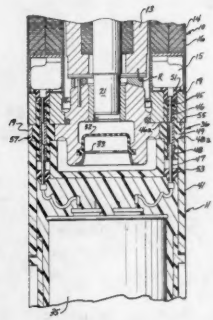
A direct-current generating arrangement in which a *Y*-connected alternator is connected with its output to a rectifying

unit for converting the alternating current generated, into corresponding direct current. An electrically insulating plate with conductive element on its surface, is operatively connected, through these conductive elements, with the terminals of the rectifier and the output terminals of the alternator. One of the conductive elements in the form of a conductive path stretching along the electrically insulating plate, is



connected to the neutral circuit point of the *Y* connection of the alternator. A second conductive element or path is connected with the terminal of the rectifier. Interconnecting passage elements, when not severed, lead the conductive elements or paths on the insulating plate, to form an integral structure of the conductive element, so that the network of conductive elements may be stamped from a single sheet of conductive material.

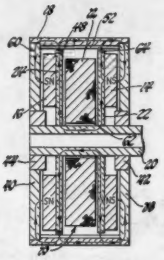
3,604,964
SUBMERSIBLE MOTOR CONNECTOR ASSEMBLY
Kenneth W. Conrad, Davenport, and Elmer M. Deters, Muscatine, both of, Iowa, assignors to Red Jacket Manufacturing Company, Davenport, Iowa
Filed May 20, 1970, Ser. No. 38,976
Int. Cl. H02k *5/22*
U.S. Cl. 310—71 **16 Claims**



A submersible motor connector assembly in which prong-type connectors are located in sockets on a submersible electric motor and on a detachable motor components housing, and a double-ended connector member is provided for electrically connecting the prongs on the motor and housing and for sealing the same from the surrounding medium.

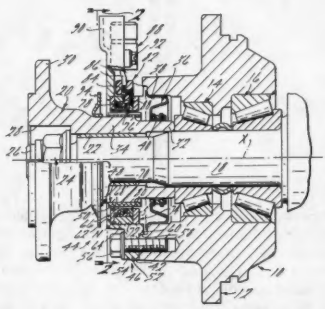
3,604,965
DOUBLE MAGNETIC ALTERNATE PATH SIGNAL GENERATOR
Richard S. Stroud, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 13, 1970, Ser. No. 19,436
Int. Cl. H02k *21/38*
U.S. Cl. 310—155 **5 Claims**

A signal generator having a stator and a rotor in which either the stator or the rotor is comprised of two members each having teeth around its periphery. The two members are positioned such that the teeth on the two members are out of phase with each other. Two permanent magnets are provided wherein each one is associated with one of the toothed members. The remaining stator or rotor has teeth confronting the teeth on the two members such that when the rotor is



rotated, alternate magnetic paths are provided for each of the magnets. A coil is associated with the two members such that when the rotor is rotated, changing flux which results from the providing of alternate paths for the flux output of the permanent magnets induces a voltage in the coil corresponding to the changing flux and, therefore, the rotation of the rotor.

3,604,966
ROTATIONAL SPEED SENSOR
John V. Liggett, Westland, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Sept. 22, 1969, Ser. No. 859,775
Int. Cl. H02k *17/42*
U.S. Cl. 310—168 **9 Claims**

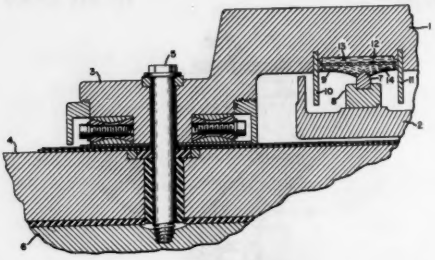


A rotational speed sensor for a skid control system for sensing the rotational speed of a prop shaft of a wheeled vehicle having a rotor mounted for rotation with a prop shaft and a stator mounted on the differential housing of the vehicle. The stator and rotor are provided with confronting circumferentially disposed teeth with the stator further including a coil for providing an output signal to the skid control system and the rotor further including a magnet for establishing a flux through the coil.

3,604,967
LIQUID METAL COLLECTOR VELOCITY DIVIDER
Gerd E. Krulls, and Earl R. Booser, both of Scotia, N.Y., assignors to General Electric Company
Filed Apr. 10, 1970, Ser. No. 27,357
Int. Cl. H02k *31/00*
U.S. Cl. 310—178 **3 Claims**

Liquid metal collector is provided with a rotatable cup member and a stationary conductor blade. A floating ring is

positioned generally intermediate between the blade and cup member and is immersed in the liquid metal such that is effectively reduces the rotational velocity of the liquid metal relative to the ring members by approximately one-half over



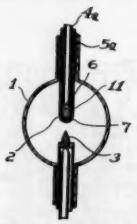
the surface of the conductor blade. By so reducing the velocity of the liquid metal, power losses are reduced and antierosion characteristics are improved. A plurality of floating rings may be employed which will reduce the relative velocities even more.

3,604,968

HIGH PRESSURE DISCHARGE LAMP OF THE COOLED ELECTRODE TYPE

Yasuhiro Shimizu, and Yoshihiko Nakamura, both of Himeji, Japan, assignors to Ushio Electric Inc., Tokyo, Japan

Filed June 27, 1969, Ser. No. 837,294
Claims priority, application Japan, July 1, 1968, 45,207/68
Int. Cl. H01j *61/52*
U.S. Cl. 313—32 **1 Claim**



A high pressure discharge lamp of the cooled electrode type comprising electrodes, an envelope sealing portion for said electrodes and said envelope, and a cooling liquid inlet passage and a cooling liquid outlet passage formed in the interior of at least one of said electrodes for introducing a cooling liquid into same discharging same therefrom. An indented or grooved portion and bulkheads are provided so as to form a snaky cooling liquid passage in the interior of the forward end portion of said electrode for increasing the area for dissipating heat from the electrode and for increasing mechanical strength of the forward end portion of said electrode.

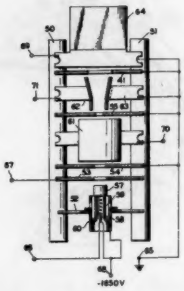
3,604,969

MINIATURIZED CATHODE-RAY TUBE WITH PRECISELY ORIENTED ELECTROSTATIC DEFLECTION ELECTRODES

Horst H. Blumenberg, Owensboro, Ky., assignor to Kentucky Electronics, Inc., Owensboro, Ky.

Division of Ser. No. 843,296, July 22, 1969
Filed Sept 29, 1969, Ser. No. 861,788
Int. Cl. H01j *29/74, 29/82*
U.S. Cl. 313—78 **4 Claims**

A character display system has a plurality of small cylindrical side-by-side cathode-ray tubes about 0.8 inch in diameter and less than 4 inches long, aligned to form a line of individual characters. The tubes have structure for precisely aligning the characters uniformly including an electron gun fashioned to center the electron beam by means of electrostatic deflection electrode pairs held in two glass beads oriented with a seven pin miniature glass stem to produce two normal deflection axes. Similar electrode structure is em-



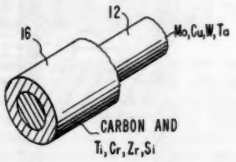
ployed for a plurality of electrodes in the gun formed of a rectangular-shaped blank held at opposite ends in the two beads, and a set of snubber springs is affixed to one such electrode oriented toward the stem to and in centering the gun within the tube cylindrical walls.

3,604,970

NONELECTRON EMISSIVE ELECTRODE STRUCTURE UTILIZING ION-PLATED NONEMISSIVE COATINGS

Robert D. Culbertson, Campbell; Russell C. McRae, Cupertino, and Harold P. Meyn, Palo Alto, all of, Calif., assignors to Varian Associates, Palo Alto, Calif.

Continuation-in-part of application Ser. No. 666,802, Sept. 11, 1967, now abandoned. This application Oct. 14, 1968, Ser. No. 767,170
Int. Cl. H01j *43/00*
U.S. Cl. 313—107 **1 Claim**



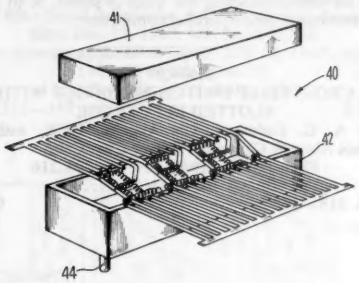
A nonemissive electrode structure is disclosed together with a method for fabricating same. The nonelectron emissive electrode structure includes a core member which may be made of any one of a number of different metals such as molybdenum, copper, tantalum or tungsten. A nonelectron emissive material is deposited over the core metal. The nonemissive deposited layer may be any one of a number of different materials which will provide electron emission inhibiting characteristics in the presence of surface contamination by barium and/or strontium. Examples of such electron emission inhibiting materials include titanium, chromium, zirconium, or silicon. An outer coating of carbon is formed over the emission inhibiting layer to further enhance the nonelectron emissive characteristics of the electrode. Alternatively, the nonemissive deposited layer and carbon coating may be codeposited into a single covering layer deposited over the core material. The electrode structure is especially suitable as a grid structure in an electron discharge device employing either an oxide coated cathode or a dispenser cathode of the type containing barium and/or strontium.

3,604,971

FILAMENT MOUNTING STRUCTURE FOR DISPLAY DEVICE

Robert A. Tracy, Mountain View, Calif., assignor to The Singer Company, New York, N.Y.

Filed July 30, 1969, Ser. No. 846,105
Int. Cl. H01k 9/00, 1/42; H01i 1/28
U.S. Cl. 313—109.5 7 Claims



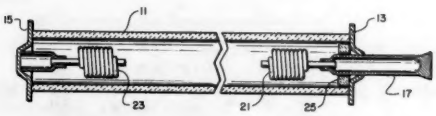
A filament display device which is suitable for use as a readout device for a wide variety of electronic devices, especially those utilizing integrated circuits, employs a plurality of incandescent filaments arranged to form a character array. In one embodiment, a character array is formed by bonding each character segment to different ends of a preformed lead assembly. In another embodiment, the array is constructed by building up the leads and filaments by the electroforming technique. After forming the character array, it is placed in an enclosure which is then evacuated and backfilled slightly with an inert atmosphere. A plurality of such arrays can be simultaneously constructed and then enclosed in a single package to form an entire display panel.

3,604,972

METAL VAPOR LAMP WITH ALKALI METAL RESERVOIR MEANS

Stephen Levy, Asbury Park, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Feb. 25, 1970, Ser. No. 14,148
Int. Cl. H01j 61/22, 61/28
U.S. Cl. 313—174 2 Claims



This invention contemplates the use of a porous beryllium plug, having an oxidized surface, which is located in and adjacent to, or on the cooler end of an alkali metal vapor lamp to serve as a reservoir for the alkali metal.

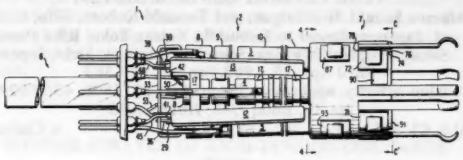
3,604,973

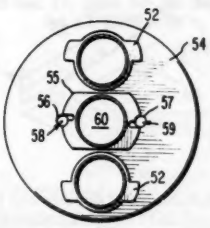
ELECTRON GUN WITH MEANS FOR ALIGNING ELECTRODES DURING ASSEMBLY

Frederick F. Doggett, East Syracuse, and Leonard W. Jenne, Jr., Baldwinsville, both of, N.Y., assignors to General Electric Company

Division of Ser. No. 731,807, May 24, 1968
Filed Sept. 16, 1969, Ser. No. 870,767
Int. Cl. H01j 1/92, 19/46, 29/50
U.S. Cl. 313—260 3 Claims

An electron gun assembly of the three gun, in-line type. The three guns each including a plurality of electrode elements are rigidly attached to four support rods or glass beads by a mounting means comprising four metal straps which connect each of the outer gun elements to two support rods and the center gun elements to all four support rods. A first group of four L-shaped metal tabs are imbedded in the ends of the support rods, and two mounting bars are each connected at both ends to two of the tabs for the purpose of making electrical connections to the gun heater elements. A second group of U-shaped metal tabs are also imbedded in the ends of the support rods to permit a mechanical connection of a stem component whereby the gun electrode elements are isolated from forces applied to the stem. A convergence assembly is self-registering with respect to the gun assembly by the alignment of precision holes in the base of the convergence assembly with cutouts provided in a flange on the center gun electrode. A plurality of slots are provided in the wall of the convergence assembly which permit self-registering of pole piece elements positioned inside the assembly.



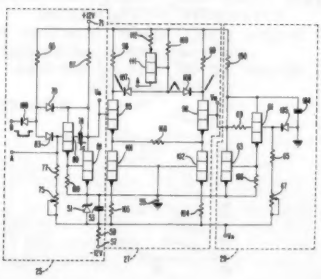


3,604,974

APERIODIC LINEARITY CORRECTION CIRCUIT FOR CRT DEFLECTION

David W. Phillips, and George W. Van Cleave, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1969, Ser. No. 882,953
Int. Cl. H01j 29/56
U.S. Cl. 315—27 GD 4 Claims



A linearity correction circuit for a cathode-ray tube incorporating a horizontal sweep generator which is responsive to a direct coupled, amplified, inverted and rectified version of its output signal, which when integrated by the horizontal sweep generator, causes a decrease in the amplitude of the horizontal sweep signal near the ends of the sweep where the nonlinearity is greatest. No reactive components are utilized

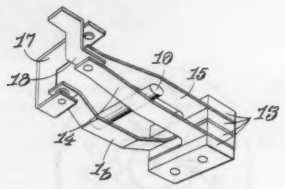
in the feedback network enabling the circuit to be reset at any time during a sweep or held in the reset position for any length of time greater than the minimum recovery time of the sweep generator with no effect on the shape of the next sweep.

3,604,975

VEHICLE LIGHT CONTROL SYSTEM

Masaru Suzuki, Hekikaigun, and Tatsushi Kubota, Gifu, both of, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishibiwajima3cho, Nishikasugai, Aichi, Japan

Filed Apr. 25, 1969, Ser. No. 819,363
Claims priority, application Japan, Apr. 29, 1968, 43/35024
Int. Cl. B60q *1/46;* **H01h** *21/18*
U.S. Cl. 315—83 **6 Claims**



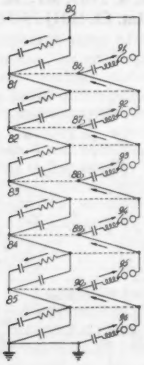
A combined switch device of dimmer and flasher comprising a first, second and third movable conductive elements arranged horizontally or vertically in parallel with and at a spacing from each other, all of said movable conductive elements serving as a dimmer switch as well as a flash switch in association with an operating member movable upwardly or downwardly from its neutral position, and having as a whole a comparatively flatter shape.

3,604,976

ELECTRICAL CIRCUIT FOR SYNTHETIC TESTING OF CIRCUIT INTERRUPTERS AND METHOD OF OPERATION

Vladislav Zajic, Montreal, Province of Quebec, Canada, assignor to Hydro-Quebec, Montreal, Quebec, Canada

Filed May 6, 1969, Ser. No. 822,161
Claims priority, application Canada, Apr. 12, 1969, 048,563
Int. Cl. G01r *31/02;* **H03k** *3/53*
U.S. Cl. 315—191 **13 Claims**



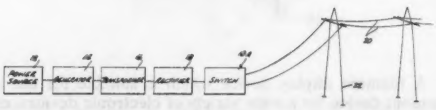
The application relates to a high voltage generator for the so-called synthetic testing of circuit interrupters operating at high and very high voltages, such generator being used more particularly in a testing circuit of the current injection type, and capable of providing successively an injection current waveform and a transient recovery voltage waveform. The generator comprises an injection branch providing the injection current waveform and a regulating branch providing the transient recovery voltage waveform. The injection branch is formed by at least two groups of elements, each comprising a capacitance, an inductance and a spark gap in series forming a unit, and by a switching system for interconnecting the units in series, or in parallel, or in a combined series-parallel connection. The regulating branch is formed by at least two groups of elements, each comprising at least one capacitance and at least one resistor forming a unit, and by a switching system for interconnecting the units in series, or in parallel, or in a combined series-parallel connection.

3,604,977

A CROSS FIELD SWITCHING DEVICE WITH A SLOTTED ELECTRODE

Gunter A. G. Hofmann, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 15, 1969, Ser. No. 791,216
Int. Cl. H05b *41/16, 41/24*
U.S. Cl. 315—267 **9 Claims**



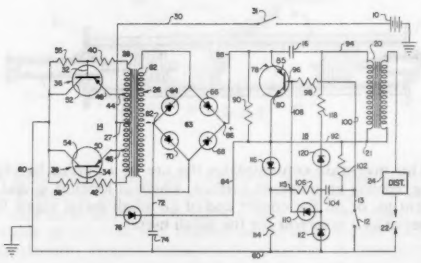
The switching device has an anode and a cathode with a gas-filled annular space therebetween. When an axial magnetic field above a critical value is applied to the gas-filled space, and after initation, cascading ionization occurs for conduction. The magnetic field above the critical value is supplied by a substantially fixed field source, and reduction below the critical value is accomplished by employing one of the electrodes as a coil through which current can be passed to change the total magnetic field with respect to the critical value.

3,604,978

CAPACITOR DISCHARGE IGNITION SYSTEM

Robert G. Van Houten, and John C. Schweitzer, both of Grand Junction, Colo., assignors to Delta Products Inc., Grand Junction, Colo.

Filed May 18, 1965, Ser. No. 456,789
Int. Cl. F02p *3/06;* **H01t** *15/02*
U.S. Cl. 315—209 CD **9 Claims**



A capacitor discharge ignition system which includes a storage capacitor, a charging circuit for charging the capacitor, a switch effectively directly connected across the output of the charging circuit and adapted to be actuated in timed relation with respect to an engine, wherein the charging circuit comprises a converter which stalls on actuation of the switch means which is connected to provide a low impedance short across the output of the converter to reset the converter and switch means in timed relation as a function of the engine speed. The switch includes a trigger circuit and a feedback circuit is provided to feed back a portion of the energy stored in the storage capacitor to effectively

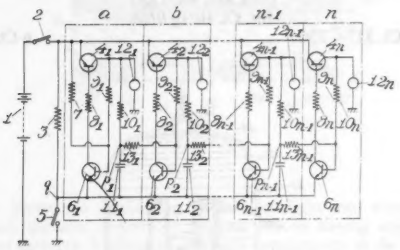
completely discharge the trigger circuit of the switch when actuated. There may further be provided means for supplying a reverse gate voltage to the switch means to prevent spurious signals from actuating same.

3,604,979

SEQUENTIAL FLASHER

Tetsuji Shimizu; Ryozo Yagi; Susumu Usami, and Shozo Naito, all of Nagoya, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi-Prefecture, Japan

Filed Oct. 31, 1967, Ser. No. 679,390
Claims priority, application Japan, July 22, 1967, Aug. 1, 1967, 42/63595; 42/66732
Int. Cl. H05b *39/09*; **B60q** *1/38*
U.S. Cl. 315—317 **5 Claims**



A sequential flasher, of the type used, for example, on automotive vehicles, includes a plurality of amplifier stages each including a pair of transistor amplifiers, a positive feedback circuit interconnecting the amplifiers, electric lamps serving as loads, and electronic time constant means, the feedback circuit in each stage being arranged in a cascade connection with the electronic time constant means. No mechanical switching elements are used. In one embodiment of the invention, each of the stages has a respective electric lamp, and a first switch is provided to connect the sequential flasher to one terminal of a source of potential, such as a battery, and a second switch is provided to connect the sequential flasher to the opposite terminal of the battery, with this second switch preferably being a cyclically operable switch.

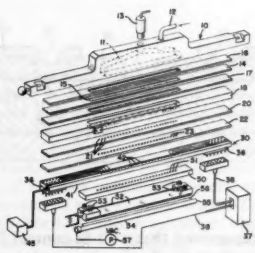
In a second embodiment of the invention, the last stage does not have a respective electric lamp, and the second switch is omitted. The last stage has associated therewith a diode which, in conjunction with the electronic time constant means of the last stage, serves to repetitively initiate operation of the sequential flasher as long as the first switch is closed.

3,604,980

DROP-CHARGING APPARATUS

John A. Robertson, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed May 25, 1970, Ser. No. 41,125
Int. Cl. G01d *15/18*; **B05b** *5/00, 5/02*
U.S. Cl. 317—3 **5 Claims**



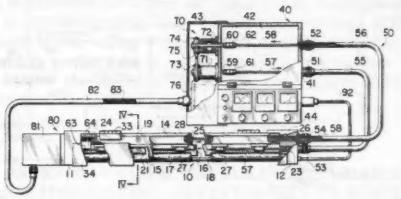
In a noncontacting coating system in which drops of coating material are selectively charged to divert them from their normal trajectory and thereby permit a patterned coating layer to be applied to a workpiece, the drop charging element is formed as a support plate having a planar surface parallel to the initial path of the coating drops and provided with strips of conductive material connected to appropriate leads for selectively charging the drops as they pass the conductive strips. A shield bar is positioned adjacent the support plate and notches are formed in the bar opposite the conductive strips. The shield bar may be formed of a conductive material, or coated with a conductive material at least in the area of the notches, and a selectively variable potential applied thereto to adjust the trajectory of all drops simultaneously.

3,604,981

POWDER SPRAYER OF HIGH-TENSION DISCHARGE TYPE

Shiro Saito, Tokyo, Japan, assignor to Nikka Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1969, Ser. No. 886,651
Int. Cl. B05b *5/04*
U.S. Cl. 317—3 **9 Claims**



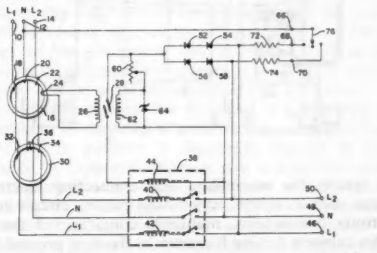
A powder spray of high-tension discharge type has an elongated thin main body installed within a narrow restricted space of a printing machine or the like. The main body comprises a roller, an elongated blockaded space closed at one side by the roller, and an elongated blockaded passage communicating with the blockaded space at one end portion thereof. Powder is a powder box provided separately from the main body is fed into the blockaded space by a feed screw conveyor passing through said space. The powder carried outside of the main body in accordance with the rotation of the roller is blown-down by discharge between the roller and an insulated electric wire extending parallel to said roller. The extra powder in the space is carried into the blockaded passage and is returned to the powder box by another screw conveyor passing through the blockaded passage.

3,604,982

GROUND FAULT AND OVERLOAD CURRENT INTERRUPTING APPARATUS

Thomas M. McDonald, Monroe, Conn., assignor to Hubbell Harvey Incorporated, Bridgeport, Conn.

Filed Feb. 13, 9169, Ser. No. 798,956
Int. Cl. H02h *3/16*
U.S. Cl. 317—18 R **9 Claims**



A unit which combines the features of electrical overload and ground fault protection. A single circuit breaker includes

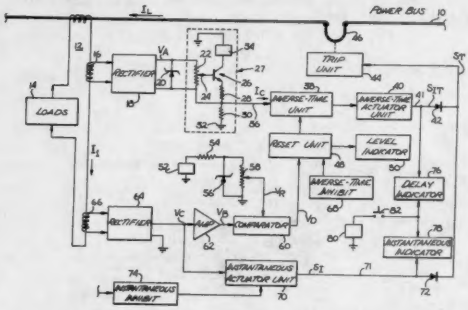
overload tripping coils and a shunt coil which is energized by the output of a differential transformer. In one form, the unit is designed to operate in a three-wire, grounded neutral system. The shunt coil is operable from both line conductors so that operation from a two-wire supply is possible without modification.

3,604,983

INSTANTANEOUS AND INVERSE-TIME-OVERCURRENT SENSOR

Harry P. Levin, North Hollywood, and Robert K. Bunce, Pasadena, both of, Calif., assignors to Automation Electric, Inc., Vernon, Calif.

Filed May 19, 1969, Ser. No. 825,737
Int. Cl. H02h *3/08*
U.S. Cl. 317—38 **21 Claims**



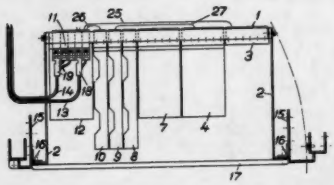
An instantaneous and inverse time-overcurrent sensor for protecting a monitored circuit against overload conditions. The sensor includes a solid state reactor stage coupled to an inverse-time unit so as to produce a trip signal when a time-overcurrent condition in the monitored circuit exceeds a selected value. The t time-overcurrent characteristics of the device are readily adjustable to cover most circuit protection requirements. Additional circuitry is provided for producing an instantaneous trip signal upon the occurrence of an excessively high value of overcurrent. Indicator devices are provide d for giving visual indications, and retaining such indications, after the occurrence of an instantaneous or an inverse-time trip.

3,604,984

ELECTRICAL CONNECTION SYSTEM FORMED OF PLINTHS WITH OPPOSED PAIRS OF ROLLS IN FRONT AND BACK FOR RECEIVING CONNECTORS

Per Andreassen, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Continuation-in-part of application Ser. No. 767,153, Oct. 14, 1968. This application Dec. 22, 1969, Ser. No. 887,008
Int. Cl. H02b *1/04*; **H01r** *31/08*
U.S. Cl. 317—99 **3 Claims**



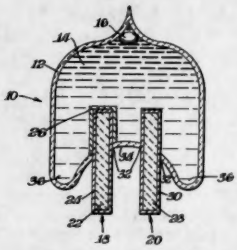
A system for assembling and connecting electrical apparatus such as relays, supervision panels, circuit cards and electrode connections, multipole contacts and the like includes cabinets having frameworks fixed or pivoted in them. Assembly frames attached to the framework carry a number of connection plinths, module determined in size, having holes arranged in pairs in rows to receive contact sockets from one side of the plinth and contact pins for direct engagement in the sockets from the other side. The pins are held in the sockets by connecting elements provided with resilient tongues arranged in recesses inside the plinth. The connection elements are common to a pair of holes, and are provided with openings in their legs which are engageable over projections on the contact pins.

3,604,985

COULOMETRIC DEVICE WITH NONCONDUCTIVE INORGANIC ELECTRODE SUBSTRATE

David B. Peck, and Walter W. Schroeder, both of Williamstown, Mass., assignors to Sprague Electric Company,, North Adams, Mass.

Continuation-in-part of application Ser. No. 792,648, Jan. 21, 1969, now Patent No. 3,564,343. This application Feb. 2, 1970, Ser. No. 7,657
Int. Cl. H01g *9/06*
U.S. Cl. 317—230 **6 Claims**



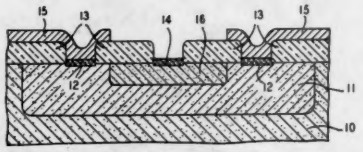
A coulometric cell employs a nonconductive inorganic envelope containing an electrolyte and an expansion bubble. First and second spaced electrode members extend from outside of said envelope, through the wall thereof and into said electrolyte. Each electrode member comprises a nonconductive inorganic substrate having at least the same coefficient of thermal expansion as that of the inorganic envelope. Each substrate carries a thin conductive film which extends from within to outside of said envelope. The envelope is bonded in fluidtight arrangement about the periphery of the electrode members where they pass through the wall thereof.

3,604,986

HIGH FREQUENCY TRANSISTORS WITH SHALLOW EMITTERS

Martin Paul Lepselter, New Providence, and Alfred Urquhart MacRae, Berkeley Heights, both of, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Mar. 17, 1970, Ser. No. 20,308
Int. Cl. H01l *11/06*
U.S. Cl. 317—235 **9 Claims**



It has been recognized that a Pt-Si contact forms without the usual concentration of minority carrier recombination sites. Thus, as applied to emitter regions, the contact appears to be an extension of the semiconductor. This allows the emitter region to be very shallow leading to better control of

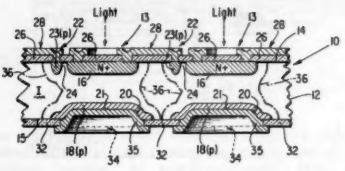
the base width. Methods for fabrication taking advantage of ion implantation techniques for forming very shallow, sharp emitter profiles are also described.

3,604,987

RADIATION-SENSING DEVICE COMPRISING AN ARRAY OF PHOTODIODES AND SWITCHING DEVICES IN A BODY OF SEMICONDUCTOR MATERIAL

Jacques M. Assour, Princeton, N.J., assignor to RCA Corporation

Filed Dec. 6, 1968, Ser. No. 781,753
Int. Cl. H01l *11/00*
U.S. Cl. 250—209 10 Claims



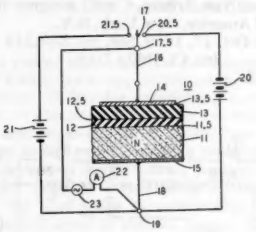
A device for converting patterns of light into electrical signals includes a body of intrinsic silicon having opposed major surfaces. Regions of one type conductivity in the body adjacent to one of the major surfaces and regions of relatively opposite type conductivity adjacent to the other major surface, separated by material of the body of predetermined thickness, define an *x–y* array of high-speed PIN photodiodes. Other regions adjacent to the one major surface define low capacitance PIN switching diodes for isolating the photodiodes.

3,604,988

SEMICONDUCTOR MEMORY APPARATUS WITH A MULTILAYER INSULATOR CONTACTING THE SEMICONDUCTOR

Dawon Kahng, Bridgewater Township, Somerset County, and Edward H. Nicollian, Murray Hill, both of, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Oct. 3, 1969, Ser. No. 863,663
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 R 5 Claims



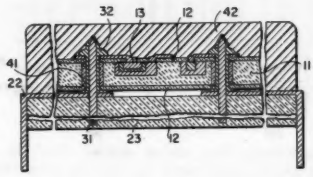
An electronic memory apparatus is disclosed in which the memory element is an insulated gate field effect transistor (IGFET) whose gate contains a metal electrode located on top of two parallel layered insulators, such as silicon oxide and zinc sulfide. The memory of a signal voltage applied to the gate electrode is provided by the phenomenon of tunneling of electrical charges between the metal electrode and the interface between the two insulator layers. These charges are trapped at this interface until a voltage of opposite sign is applied which is sufficient to discharge ("erase") the trapped charges at the interface. Nondestructive readout of the presence or absence of these trapped charges is afforded by monitoring the source-drain current in the transistor.

3,604,989

STRUCTURE FOR RIGIDLY MOUNTING A SEMICONDUCTOR CHIP ON A LEAD-OUT BASE PLATE

Yuichi Haneta, and Toshio Wada, both of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Oct. 9, 1969, Ser. No. 864,995
Claims priority, application Japan, Oct. 11, 1968, 43/74355
Int. Cl. H01l *1/14*
U.S. Cl. 317—234 R 3 Claims



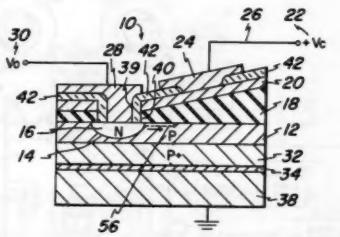
A semiconductor wiring unit is formed by passing conducting needles projecting from a stem plate through apertures formed in the wiring layers of a semiconductor chip. The apertures are located in registration with the needles. After insertion in the apertures the needles are soldered to the wiring layers.

3,604,990

SMOOTHLY CHANGING VOLTAGE-VARIABLE CAPACITOR HAVING AN EXTENDIBLE PN JUNCTION REGION

Raymond A. Sigsbee, Schenectady, N.Y., assignor to General Electric Company

Filed Apr. 1, 1970, Ser. No. 24,653
Int. Cl. H01l *5/02*
U.S. Cl. 317—234 R 14 Claims



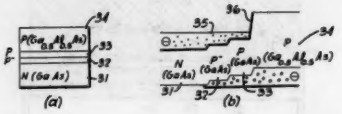
A voltage-variable semiconductive capacitor is described wherein a smooth alteration in output capacitance is produced by incrementally extending a PN junction along the surface of a semiconductive body with an inversion layer formed below a control electrode insulator characterized by a decreased capacitance with increased span of the insulator from the expanding edge of the PN junction. In a first embodiment of the invention, the decreased capacitance is achieved by increasing the thickness of the control electrode insulator at a linear slope between 0.25 and 3.0 percent while in a second embodiment, the thickness of the control electrode insulator is increased in uniform steps of approximately 200–500 A, to produce a digitalized change in output capacitance. A capacitor structure also is described wherein isolated regions of a first type conductivity within a semiconductive body of second type conductivity are sequentially interconnected utilizing commonly energized control electrodes having a gradually reduced capacitance relative to the underlying semiconductive body with increased departure of each electrode from the edge of the initially extended region.

3,604,991

INJECTION-TYPE SEMICONDUCTOR LASER ELEMENT

Hiroo Yonezu, and Akira Kawaji, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 30, 1970, Ser. No. 23,631
Claims priority, application Japan, Apr. 1, 1969, 25335/1969
Int. Cl. H01l *15/00*
U.S. Cl. 317—235 R 5 Claims



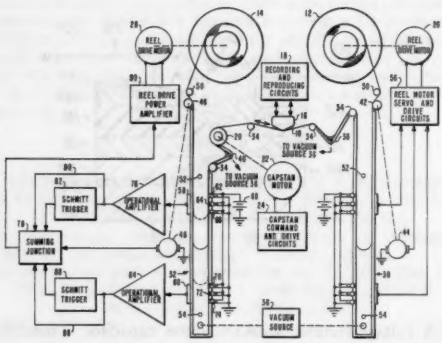
An injection-type semiconductor laser element is disclosed having an N-type substrate, a P^1-type layer having a specified thickness and impurity concentration on the substrate, a highly doped P-type layer on the P^1-type layer, and a P^+-type layer on the P-type layer. In an alternative device, a P-type layer of a different material and having a larger band gap is placed on the highly doped P-type layer.

3,604,992

REEL SERVO SYSTEM

Azmi S. Audeh, Camarillo; Anil N. Deodhar, West Los Angeles, and Henry G. Glattfelder, Los Angeles, all of, Calif.

Filed Feb. 10, 1970, Ser. No. 10,255
Int. Cl. B65h *59/38;* H02p *7/68*
U.S. Cl. 318—6 14 Claims



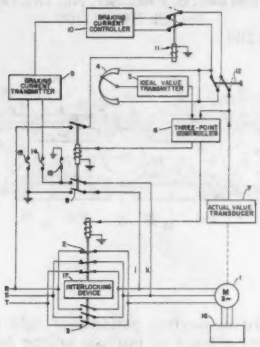
A reel servosystem for a digital magnetic tape transport responds to tape loop length signals from two spaced-apart linear sensors in a vacuum chamber and a reel motor braking signal which is proportional to tape velocity at some point between the vacuum chamber and the associated tape reel. A Schmitt trigger increases the tape loop length signals by a selected amount whenever they exceed a threshold magnitude thereby providing a more rapid response and cancelling the effect of the braking signal. A summing junction provides a signal representing the sum of the tape loop length signals and the reel motor-braking signal to drive the reel motor. During steady state operation the reel motor drive signal is proportional to the length of the tape loop and maintains the tape loop at selected reference positions within the vacuum chamber dependent on direction.

3,604,993

SPEED CONTROL SYSTEM FOR CONVEYING MACHINE ENERGIZED BY THREE-PHASE CURRENT

Erich Volkert; Klaus Gunther, and Gunter Willkommem, all of Erfurt, Germany, assignors to Veb Starkstrom-Anlagenbau, Erfurt, Germany

Filed Oct. 11, 1968, Ser. No. 766,722
Int. Cl. H02p *3/24*
U.S. Cl. 318—212 5 Claims



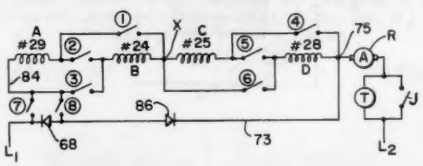
An ideal value transmitter provides an ideal value voltage corresponding in magnitude to a desired speed of a conveying machine. An actual value transducer coupled to the rotor of the conveying machine provides an actual value voltage corresponding in magnitude to the actual speed of the machine. A three point controller connected to the transmitter and transducer provides a control signal equal to the difference in magnitude between the ideal and actual value voltages. Two reversing contactors coupled to the controller and connected to the stator of the machine supplies three-phase current to the machine under the control of the control signal provided by the controller. A direct current contactor coupled to the controller and connected to the stator of the machine supplies direct current to the machine under the control of the control signal.

3,604,994

LIQUIDIZER SPEED CONTROL

William J. Conlon, New Britain, Conn., assignor to Dynamics Corporation of America, New York, N.Y.

Filed Oct. 17, 1969, Ser. No. 867,315
Int. Cl. H02p *7/10*
U.S. Cl. 318—252 16 Claims

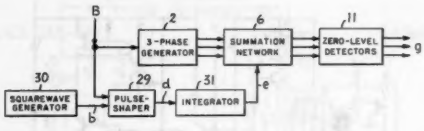


A food-comminuting device driven by a universal fractional horsepower motor in which a speed control includes oppositely poled serially connected semiconductors that shunt a field of variable impedance for a high speed range and one of the semiconductors is switched into series relationship with the field for a low speed range to eliminate any overlapping of the speed ranges. The motor can be turned OFF in three ways with the speed control switches by removing the semiconductors from the motor circuit or permutation opening of a plurality of the speed control switches employed, or both.

3,604,995
GENERATOR FOR PRODUCING A WIDTH-MODULATED SQUARE VOLTAGE

Arne Jensen, Als, and Tom Kastrup Petersen, Nordborg, both of, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Aug. 27, 1968, Ser. No. 755,538
Claims priority, application Germany, Aug. 29, 1967, D 53 958 VIIIb/21c
Int. Cl. H02p *5/16*
U.S. Cl. 318—341 **10 Claims**

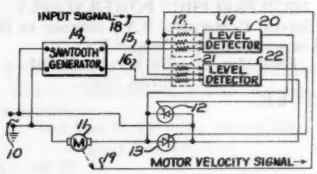


Apparatus producing a width modulated square wave for use in a motor control circuit controlling the speed of an alternating-current motor. A low frequency three-phase generator with stationary components develops three wave outputs integrated and summed with a high frequency wave signal, in a summation circuit, produced by a frequency generator. The sign of the outputs of the summation circuit is ascertained by zero level detectors and employed for controlling the motor speed. A direct-current control voltage is applied to the apparatus to control the amplitude of the high and low frequency waves.

3,604,996
CONTROLLED POWER SUPPLY SYSTEM

Fritz Norman Lutz, Northfield, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Sept. 26, 1968, Ser. No. 762,858
Int. Cl. H02p *5/16*
U.S. Cl. 318—345 **27 Claims**



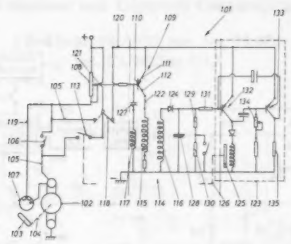
Controlled power supply system for connection to an AC source and having two oppositely connected silicon controlled rectifiers (SCRs) for conducting current in opposite directions to an electrical load. Two sawtooth waves of opposite slope and phase-displaced by 180° are combined with an error signal to determine the firing times of the SCRs. The error signal represents the difference between a desired value and the actual value of a load variable, such as rotational speed when the load is an electric motor. Each sawtooth wave has a period equal to the AC source signal and during each cycle has a straight line slope for 270°, is abruptly reset to a reference level, and remains at the reference level for the remaining 90° of the cycle.

3,604,997
CONTROL SYSTEM FOR THE DRIVING MOTOR OF WINDSHIELD WIPERS

Karl Kirchner, and Ernst Kirchner, both of Schanzstrasse 2, Friedrichshafen, Germany

Filed Apr. 15, 1969, Ser. No. 816,251
Claims priority, application Germany, Apr. 29, 1968, Aug. 13, 1968, Jan. 28, 1969, P 17 55 347.8;P 17 80 187.5;P 19 03 990.8
Int. Cl. B60s *1/08*
U.S. Cl. 318—443 **9 Claims**

An intermittent windshield wiper system having a first switch actuated by a voltage drop responsive to the motor load, timing means comprising an unstable multivibrator ac-

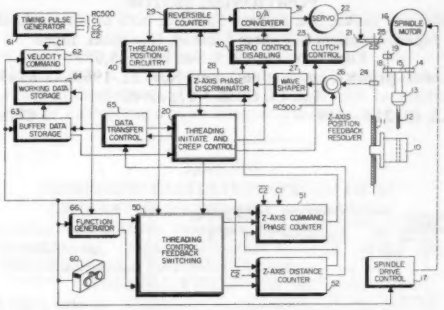


tuated by the first switch means and controlling second switch means in series with the motor and a power source.

3,604,998
DUAL DRIVE SERVO-CONTROLLED THREAD CUTTER INCLUDING MODE ENGAGEMENT FEATURES

Thomas P. Haught, Stuarts Draft, and James W. Stugart, Waynesboro, both of, Va., assignors to General Electric Company

Filed Dec. 24, 1968, Ser. No. 786,671
Int. Cl. G05b *7/00*
U.S. Cl. 318—591 **7 Claims**



A controlled machine-positioning system wherein machine movement may be determined by separate drive sources, one of which is servo-controlled and directly responsive to input data, and the other being only indirectly controlled. This system is particularly useful as incorporated in numerically controlled arrangements for certain unique threadcutting operations and wherein the normal servocontrol is not wanted for a particular operating mode.

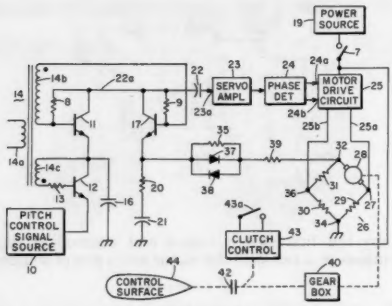
3,604,999
POSITION SERVOMECHANISM INCLUDING A SYNCHRONIZING CIRCUIT FOR BUMPLESS ENGAGEMENT OF A CLUTCHED LOAD

Frank David Pugh, Pompano Beach, Fla., assignor to The Bendix Corporation

Filed Oct. 20, 1969, Ser. No. 867,475
Int. Cl. G05b *7/00*
U.S. Cl. 318—591 **7 Claims**

A servosystem motor driven by an error signal is connected to a controlled element through a clutch which is disengaged when the servosystem is initially energized. Resulting rapid movement of the now unloaded motor generates a large feedback voltage which is derived from motor back e.m.f. Feedback voltage is applied to an integrating feedback circuit to generate a degenerative feedback signal having servomotor velocity and displacement components. A servosystem modulator combines a command signal with the

feedback signal to generate the error signal which is thus minimized before the clutch is engaged to provide automatic



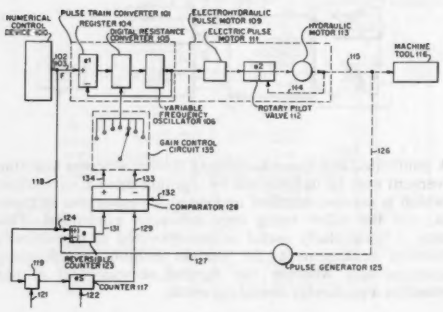
synchronization of the servosystem with the element. The clutch may now be engaged without abrupt, dangerous movement of the element.

3,605,000

NUMERICAL CONTROL INCLUDING A VARIABLE GAIN LOOP CONTROLLING A PILOT STEPPING MOTOR CONTROLLING AN ELECTROHYDRAULIC POSITIONING MOTOR

Seiuemon Inaba, and Kanryo Shimizu, both of Kawasaki-shi, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 19, 1969, Ser. No. 878,059
Claims priority, application Japan, Nov. 21, 1968, 43-85479
Int. Cl. G05b *5/01, 19/40*
U.S. Cl. 318—619 **6 Claims**



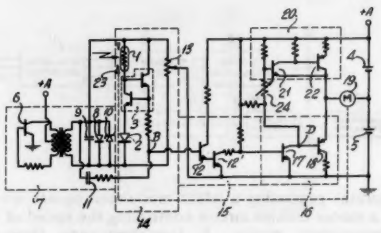
A pulse train converter converts a first command pulse train issued by command pulse means to a second command pulse train and supplies the second command pulse train to electrohydraulic pulse motor. The pulse train converter has a storage connected to the command pulse means for storing the difference in the number of pulses of the first and second command pulse trains and an oscillator connected to the storage for issuing the second command pulse train at a frequency proportional to the content of the storage. A comparer coupled between the command pulse means and the motor detects the difference between the number of pulses in the first command pulse train and the revolutions of the motor. A gain control connects the comparer to the pulse train converter in a manner whereby the ratio of the frequency of the second pulse train to the content of the storage is controlled so that the detected difference is in proportion to the frequency of the first command pulse train.

3,605,001

SERVO-CONTROLLED CAMERA DIAPHRAGM INCLUDING A UNIQUE DITHER CIRCUIT

Seinan Miyakawa, Toshima-ku, Tokyo-to, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Aug. 19, 1969, Ser. No. 855,451
Claims priority, application Japan, Aug. 21, 1968, 43/59149
Int. Cl. G05b *11/01*
U.S. Cl. 318—631 **4 Claims**



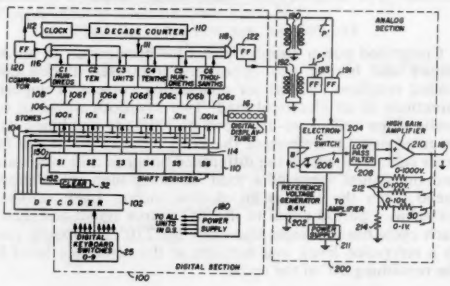
A light-controlled automatic diaphragm comprises a network including a photoconductor and potentiometer for producing a DC information signal responsive to the light incident on the photoconductor and the setting of the potentiometer which is adjusted to other photographing parameters. A DC motor is connected to a diaphragm intercepting the light to the photoconductor and an amplifier network controlled by the information signal controls the direction and value of current to the motor and hence its direction of rotation. An oscillator energized by the motor power supply applies an AC signal to the information signal so that AC current is applied to the motor when it approaches its stop condition to brake the motor, the oscillator output being rectified to energize the information signal network.

3,605,002

HIGH PRECISION POWER SUPPLY

Robert C. Smyth, Centerport, N.Y., assignor to Digital Apparatus Corporation, Deer Park, N.Y.

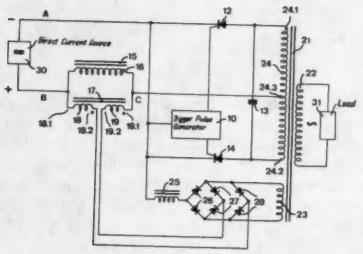
Filed Mar. 27, 1970, Ser. No. 23,261
Int. Cl. H02m *7/00*
U.S. Cl. 321—8 R **7 Claims**



A high precision power supply generates voltage with an accuracy of at least 30 parts per million and is comprised of a digital section interconnected with an analog section by pulse transformers. Numbered keyboard switches in the digital section select a desired output voltage which is displayed numerically by electronic digital display tubes. A shift register in circuit with number storage means enables any one of the displayed numbers to be changed without changing any other displayed number. The analog section includes a stable reference voltage generator, electronic switch, filter and a high gain amplifier which produces an output voltage corresponding to the displayed numbers. The electronic switch

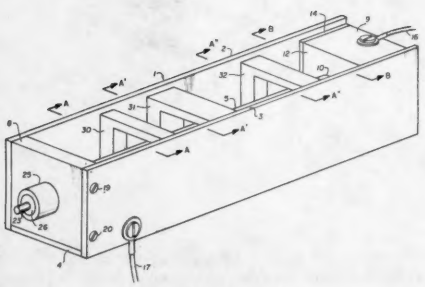
passes proportional parts of the reference voltage to the amplifier via the filter under control of pulses received from the digital section. The amplifier is capable of producing current in one of two ranges depending upon the output voltage.

3,605,003
STABILIZED SINE WAVE INVERTER
Walter B. Guggi, CH-8172 Niederglatt, Switzerland
Filed Mar. 30, 1970, Ser. No. 024,007
Claims priority, application Switzerland, Mar. 26, 1969, 004893/69
Int. Cl. H02m *7/48*
U.S. Cl. 321—45 **6 Claims**



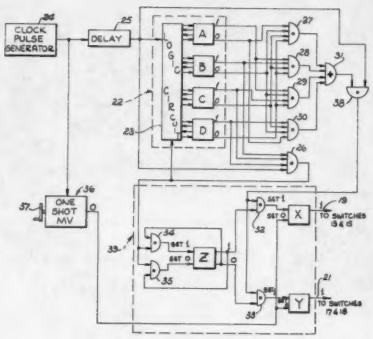
Direct current is converted into alternating current by rendering switches such as SCR's alternatively conductive and thereby providing an alternating current flow within an arrangement of inductors and capacitors. Some of the alternating current is rectified and fed back through appropriate networks to the DC current input side of the inverter thereby stabilizing the output voltage and preserving the wave shape generated by the inverter as the load changes.

3,605,004
HIGH EFFICIENCY DIODE SIGNAL GENERATOR
Martin I. Grace, Framingham, Mass., assignor to Sperry Rand Corporation
Filed June 16, 1970, Ser. No. 46,708
Int. Cl. H02m *5/16*
U.S. Cl. 321—69 W **11 Claims**



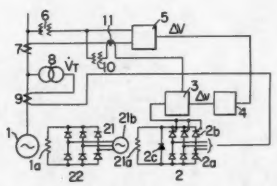
A microwave of high-frequency amplifier or frequency converter which exploits and open-faced nonradiating waveguiding circuit configuration for efficient interaction with a semiconductor high-efficiency-mode diode. Because of the geometrical nature of the circuit, manufacture and adjustment of the amplifier are facilitated.

3,605,005
INVERTERS
Albert Donald Stolzy, Sherman Oaks, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Sept. 10, 1970, Ser. No. 71,000
Int. Cl. H02m *1/12*
U.S. Cl. 321—9 A **20 Claims**



An inverter which can eliminate lower harmonics of a fundamental by switch timing. However, any number of harmonics may, in fact, be eliminated. Filter design is thus much less complex and expensive and, in some cases, a filter may be eliminated. It is an outstanding feature of the invention that the embodiments of FIGS. **1**, **2** and **5** may be entirely and easily incorporated in an integrated circuit.

3,605,006
COMPOUND EXCITATION SYSTEM OF AC GENERATOR BY THYRISTOR CONTROL
Masaomi Nagae; Sumio Yokokawa, and Takehito Inoue, all of Kawasaki-shi, Japan, assignors to Fuji Denki Seizo Kabushiki Kaisha, Kawasaki-shi, Japan
Filed July 7, 1969, Ser. No. 839,465
Claims priority, application Japan, July 15, 1968, July 15, 1968, July 12, 1968, 43/60398;43/60399;43/49222
Int. Cl. H02p *9/30*
U.S. Cl. 322—24 **4 Claims**



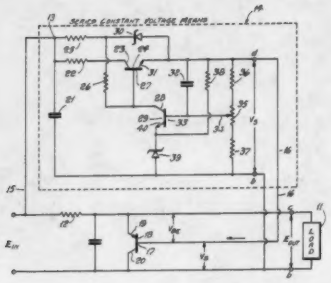
For the excitation of an AC generator, a voltage being in proportion to the terminal voltage of the generator and a voltage being in proportion to the load current of the generator are combined vectorially, and the resultant sum-voltage is impressed on a field winding of the generator through a rectifying device with thyristors for the supply of a field current. Separately, an electric quantity of the same phase as the resultant voltage is prepared as a synchronizing signal for an ignition pulse regulator controlling the thyristors.

3,605,007

DC POWER SUPPLY REGULATED BY A SHUNT TRANSISTOR WHOSE BIAS VOLTAGE IS VARIED BY TRANSISTOR MEANS TO STABILIZE LOAD VOLTAGE

Robert E. Jehle, Woodhaven, N.Y., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 5, 1969, Ser. No. 847,670
Int. Cl. G05f 1/60
U.S. Cl. 323—22 T 4 Claims



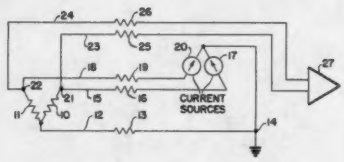
An adjustable DC power supply regulated by the combination of a voltage dropping resistor in series between the DC source and the load, a transistor shunting the load, and other transistor circuitry that monitors the load voltage while drawing very little current, and responds to any load voltage change to adjust the bias on the shunt transistor in a direction to change the current drawn by the shunt transistor and thereby to change the voltage drop across the voltage dropping resistor to oppose change in load voltage.

3,605,008

TRANSDUCER NETWORK WITH CURRENT SOURCE CONDITIONING

William E. Shoemaker, Fullerton, and Barret B. Weekes, Newport Beach, both of, Calif., assignors to Beckman Instruments, Inc.

Division of Ser. No. 522,868, Jan. 25, 1966, Pat. No. 3,457,493
Int. Cl. G01r 17/10
U.S. Cl. 323—75 N 5 Claims



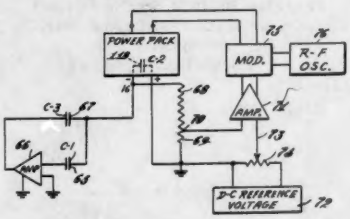
A transducer network having a multiplicity of branches and related circuit nodes is connected to a constant current supply providing a multiplicity of constant current sources. Branches and nodes of the network which are remotely located from the current sources are connected to the current sources by conductors exhibiting an inherent impedance. A pair of input terminals of a high input impedance amplifier is connected to a pair of nodes of the transducer network.

3,605,009

STABILIZED POWER SUPPLY

Harald A. Enge, Winchester, Mass., assignor to Deltaray Corporation, Winchester, Mass.

Filed May 6, 1970, Ser. No. 35,007
Int. Cl. G05f 1/46, 3/08
U.S. Cl. 323—93 7 Claims



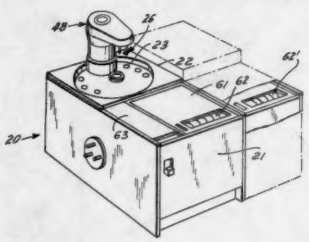
A high voltage power supply for providing highly stabilized voltages of several hundred kilovolts or more which can be applied between the filament assembly and the grounded anode of the gun for an electron microscope, for example, and made as an integral unit with the microscope structure. A plurality of stacked power deck units are mounted within an insulative tube which may also enclose the filament assembly and an accelerator tube if one is used. A coupling capacitor for feeding the output voltage to a regulator system is fashioned as an integral part of the overall structure and arranged so as to couple solely to the output voltage terminal in order to provide accurate corrections of rapid fluctuations of the output voltage. Provision is also made for the regulation of slower fluctuations, such as slow voltage drifts.

3,605,010

AUTOMATIC LYSIS DETECTION APPARATUS

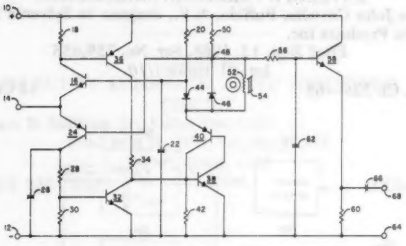
Stanford G. Folus, Randallstown, Md., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed July 14, 1969, Ser. No. 841,474
Int. Cl. G01n 27/42
U.S. Cl. 324—30 R 11 Claims



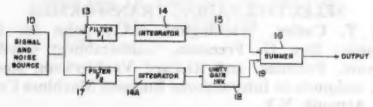
A portable compact lightweight apparatus for measuring the time for initiation of clot formation of blood or plasma by detecting the presence of fibrin, and for measuring the time required for the fibrin to lyse. The apparatus provides means for producing and detecting fibrin. Electrode means are associated with said apparatus for holding the fibrin thread. Furthermore, means are provided for producing a circuit and detecting the current flow while the fibrin is intact and shutoff means are present and responsive to the lysing of the fibrin which breaks the current path thereby recording the time for a fibrin to lyse.

3,605,011
CONTROL APPARATUS
Clifton W. Hart, Mound, and Eugene E. Rosacker, Richfield, both of, Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed May 25, 1967, Ser. No. 643,299
Int. Cl. G01r 33/02
U.S. Cl. 324—43 R 7 Claims



A pulse width modulated magnetometer utilizing a single winding and having solid-state feedback. The operation of the magnetometer lying in the method of passing current through the single winding only until its saturable core is saturated to produce a pulse width modulated output since the change in flux in the core between residual and saturated conditions is dependent upon ambient magnetic field conditions.

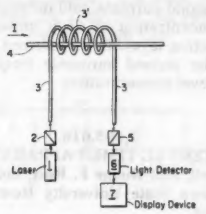
3,605,012
NOISE CANCELLATION FILTER SYSTEM
Jacob H. Kubanoff, Philadelphia, Pa., assignor to the United States of America as represented by the Secretary of the Army
Filed July 15, 1969, Ser. No. 841,825
Int. Cl. G01r 23/02; H04b 1/10
U.S. Cl. 324—78 F 3 Claims



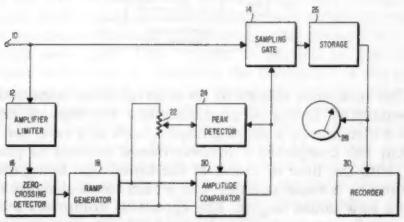
There is provided a system which detects a desired signal in the presence of random noise. A plurality of filters having successively adjacent passbands simultaneously receive a composite of noise and desired signal. Each filter passes only that portion of the composite within its respective passband. All portions are then integrated and thereafter alternate portions are inverted. Inverted and noninverted portions are then summed, the desired signal, if present, appearing as a residue. Sensing indicators connected to each summer output then indicate within which filter the desired signal appeared.

3,605,013
CURRENT-MEASURING SYSTEM UTILIZING FARADAY EFFECT ELEMENT
Shogo Yoshikawa, and Atsufumi Ueki, both of Tokyo, Japan, assignors to Nippon Selfoc Company, Limited, Tokyo, Japan
Filed Nov. 7, 1969, Ser. No. 874,926
Claims priority, application Japan, Nov. 16, 1968, 83680/43
Int. Cl. G01r 13/40, 19/00; G02f 1/22
U.S. Cl. 324—96 5 Claims

A current-measuring system comprises a fiberlike light guide capable of causing the Faraday effect. The guide is adapted to be placed in proximity to a current-carrying conductor. Polarized light is applied to one end of the guide, and the output of the guide is applied to an analyzer and a detector, thereby to provide an indication of the magnitude of the current flow in the conductor.

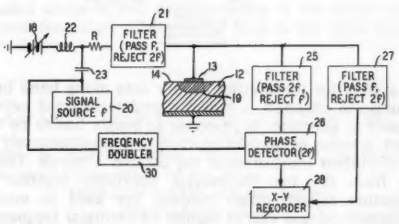


3,605,014
PHASE-SAMPLING VOLTMETER
Robert H. McCracken, 5120 Newport Ave., Chevy Chase, Md.
Filed July 17, 1969, Ser. No. 842,478
Int. Cl. G01r 19/00, 27/28
U.S. Cl. 324—102 5 Claims



A voltmeter is provided which is capable of measuring the amplitude of a recurrent input signal waveform at any selected phase. Zero-crossings of the input signal are used to synchronize a ramp generator and the output thereof is applied as one input to a comparator device. A potentiometer is used to select a fraction of the ramp voltage which is equal to the fraction of the waveform cycle which represents the desired phase. This selected fractional ramp is then peak detected to provide a reference voltage to the other input of the comparator device. When the ramp voltage reaches the desired fractional voltage, the comparator device will emit a pulse which in turn will enable a sampling gate which allows a sample of the input signal at the selected phase to be stored.

3,605,015
METHOD AND APPARATUS FOR DETERMINING DEEP IMPURITY CONCENTRATION IN SEMICONDUCTORS
John Alexander Copeland, III, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Jan. 19, 1970, Ser. No. 3,771
Int. Cl. G01r 31/22; H01l 7/00
U.S. Cl. 324—158 D 7 Claims



The deep impurity concentration of a semiconductor is determined by forming a diode region in the wafer, applying

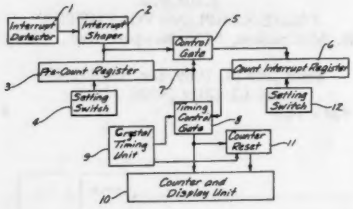
a reverse-bias voltage across the diode, applying a first alternating current to the diode, deriving a second alternating current from the diode, and determining the phase difference of the first and second currents, said difference being proportional to the concentration of deep impurity levels at the edge of the depletion layer. In a preferred embodiment, the phase shift of the second harmonic frequency is used to determine deep level concentration.

3,605,016

INTERVAL TIMER APPARATUS

Dana W. Zimmerli, and Duane F. Rost, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jan. 19, 1970, Ser. No. 3,713
Int. Cl. G04f 9/00
U.S. Cl. 324—186 **9 Claims**



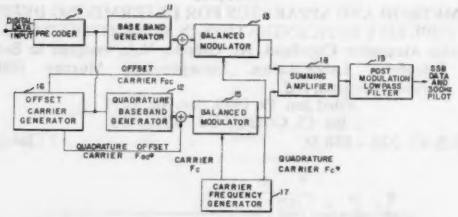
This invention relates to an interval timer apparatus for automatically timing a predetermined number of laps of known distance by a moving object, such as a race car, after the car has completed a predetermined number of practice laps; with the time or count of the timed laps being directly read out by a visual counter, and which count remains visible until a new count begins. The apparatus comprises a detection unit for producing a pulse for each interrupt by the car, which pulses are sent to a pair of preset shift register, one for the nontimed interrupts and one for the timed interrupts, with a standard clock frequency gated to a decade counter and display unit when the pulses have been shifted to the timed interrupt register.

3,605,017

SINGLE SIDEBAND DATA TRANSMISSION SYSTEM

Allan B. Chertok, Cambridge, and Philip P. Carvey, Boston, both of, Mass., assignors to EG & G Inc., Bedford, Mass.

Filed June 6, 1969, Ser. No. 831,139
Int. Cl. H04b 1/68
U.S. Cl. 325—38 **12 Claims**



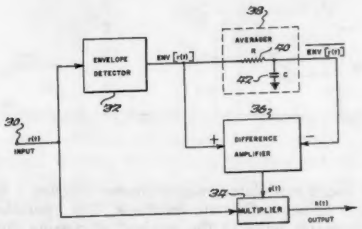
A system for transmitting binary data along band limited transmission channels in which digital transversal networks are used to generate, in response to binary bits to be transmitted, a series of doublet symbols and simultaneously a series of Hilbert transforms of the doublet symbols. The outputs from the two transversal networks, together with quadrature related offset carriers, are used to modulate quadrature related carrier signals of identical frequency to produce single-sideband suppressed carrier transmission signals including an offset pilot tone. The receiver decoder includes means responsive to the transmitted pilot tone for correcting the locally generated carrier frequency for phase jitter and phase translation introduced in the transmission channel. The receiver also includes a phase lock system for correcting phase uncertainties in the receiver arising from the pilot tone filter and from the phase of the locally generated offset carrier.

3,605,018

INTERFERENCE SUPPRESSION IN A RECEIVER BY ENVELOPE VARIATION MODULATION

Gino John Coviello, Buffalo, N.Y., assignor to Sylvania Electric Products Inc.

Filed Sept. 13, 1968, Ser. No. 759,655
Int. Cl. H04b 1/10
U.S. Cl. 325—65 **12 Claims**



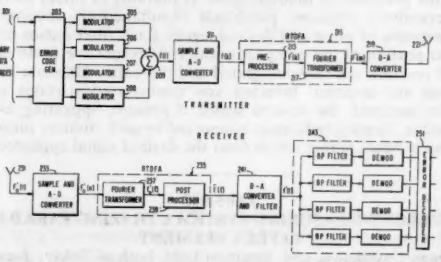
A nonlinear signal-processing circuit, especially useful in the receiver of a quaternary-phased spread spectrum communication system, for suppressing interfering signals that are stronger than the desired signal and have relatively constant waveform envelopes. The circuit includes an envelope detector combined with an averager and difference amplifier for deriving from the composite received signal a control voltage which is a function of the instantaneous phase difference between the interfering and desired signals. This control voltage and the composite received signal are then multiplied to produce as an output the desired signal with the interfering signal substantially suppressed.

3,605,019

SELECTIVE FADING TRANSFORMER

Joseph T. Cutter, Washington, D.C.; John M. Davies, Potomac; Don G. Freeman, Gaithersburg; Gordon R. Schwarz, Potomac, and Richard Vanblerkom, Rockville, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

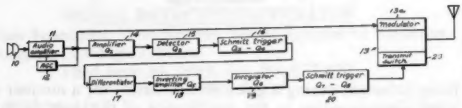
Filed Jan. 15, 1969, Ser. No. 791,415
Int. Cl. H04b 15/00
U.S. Cl. 325—65 **5 Claims**



The invention is a communication system which causes errors introduced by selective frequency fading channels to be time localized. It does this by transmitting the Fourier transform of the baseband signal. The preferred embodiment consists of a frequency division multiplexor multiplexing a plurality of channels and a Fourier transformer taking the Fourier transform of the digital representation of the resultant

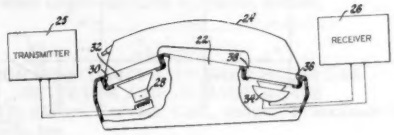
waveform. The Fourier transform is reconverted into an analog representation by a D-A converter and transmitted by means of an A-D converter. The receiver reconverts the analog representation of the Fourier transform into a digital signal, a Fourier transformer takes the inverse transform, as a D-A converter, reconverts the digital representation back into an analog waveform and then an FDM demodulator demultiplexes the analog waveform resulting in a signal representative of the input to the transmitter with errors introduced by the channels appearing as burst errors (time localized).

3,605,020
SELECTIVE AUTOMATIC AUDIO THRESHOLD CIRCUIT
William B. Sullivan, Jr., Columbus, Ohio
Filed July 31, 1970, Ser. No. 59,971
Int. Cl. H04b *1/04*
U.S. Cl. 325—152 **3 Claims**



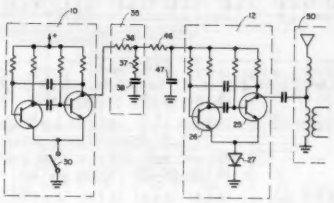
This invention is an electronic system for keying radiophone transmitters in response to audio information and more particularly to a selective automatic audio threshold circuitry with the ability to adapt to environmental noise conditions.

3,605,021
ACOUSTICAL COUPLER FOR FREQUENCY SHIFT TELEGRAPHIC SYSTEMS
Eugene A. Mychalowych, Warren, Mich., assignor to Digital Techniques Corporation, Royal Oak, Mich.
Filed Feb. 10, 1969, Ser. No. 797,730
Int. Cl. H04b *1/16*
U.S. Cl. 325—320 **13 Claims**



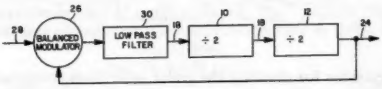
There is disclosed, in a data communication system, an acoustical coupler which enables the transmission of data over telephone lines through a conventional subscriber telephone set. The coupler serves to link or operably join an encoder-decoder, such as a teletypewriter set, with a telephone handset and thence the telephone lines. The coupler comprises a holder adapted to receive a telephone handset and includes a transmitter adapted to convert the mark and space signals of the encoder to frequency shift tone signals suitable for transmission. The coupler also includes a receiver adapted to convert tone frequency signals to mark and space signals for application to the decoder. The coupler is capable of operating in a full-duplex system, or if desired in a half-duplex system.

3,605,022
FM RECEIVER SELF-TEST CIRCUIT
Vincent J. De Fillipo, North Plainfield; Andrew R. Saldutti, Clark, and Stanley J. Zalesky, Red Bank, all of, N.J.
Filed Feb. 28, 1969, Ser. No. 803,221
Int. Cl. H04b *1/16*
U.S. Cl. 325—363 **4 Claims**



A self-testing equipment for a frequency-modulated receiver includes a pulse generator rich in harmonics and having a repetition frequency chosen such that the fundamental frequency is substantially equal to the channel spacing of the FM receiver being tested. The supply voltage for the pulse generator is derived from a power supply generator which produces a pulsating voltage varying periodically at a relatively slow rate. This voltage is applied to the pulse generator and serves to modulate the frequency of the pulse generator at the same rate. The accompanying harmonics of the pulse generator are also modulated but at a correspondingly high rate lying within the audio bandwidths of each receiver channel. Inserted between the power supply generator and the pulse generator is a time constant network which permits the supply voltage to vary exponentially during each power supply period. In this way, the frequency deviation of the pulse generator is controlled.

3,605,023
FREQUENCY DIVIDER
Arthur Jonathan Kline, Jr., Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Aug. 11, 1969, Ser. No. 849,216
Int. Cl. H03b *19/00*
U.S. Cl. 328—25 **7 Claims**

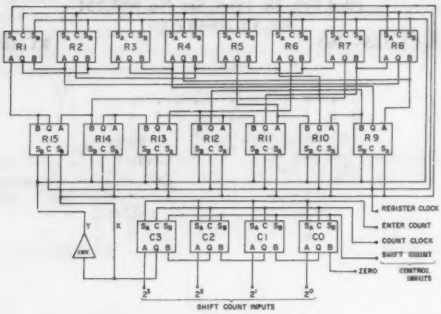


A frequency divider is disclosed which comprises one divide-by-two divider or a plurality of cascaded divide-by-two dividers. The input of the divide-by-two divider or of the cascaded divide-by-two dividers is through a balanced modulator. The output of the divide-by-two divider or of the cascaded divide-by-two dividers which is the output of the disclosed frequency divider is fed back to the other input of the modulator.

3,605,024
APPARATUS FOR SHIFTING DATA IN A LONG REGISTER
Kenneth E. Batcher, Stow, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio
Filed June 1, 1970, Ser. No. 42,186
Int. Cl. G11c *19/00*
U.S. Cl. 328—37 **5 Claims**

An improved shift register and interconnection of components related thereto is provided. With just two sets of

connections between stages of a shift register of length 2^n-1 where n is a positive integer, any end-around shift can be

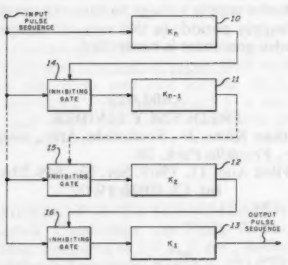


performed with n shift pulses. Modifications of the apparatus allow any register length with a slight loss in efficiency.

3,605,025
FRACTIONAL OUTPUT FREQUENCY-DIVIDING APPARATUS

Andrew James Lincoln, Concord, and Shimon Even, Cambridge, both of, Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed June 30, 1969, Ser. No. 837,666
Int. Cl. H03k 21/36
U.S. Cl. 328—48 **3 Claims**



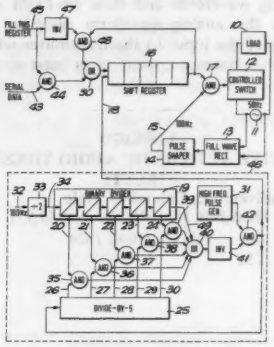
Apparatus for dividing the pulse repetition frequency of a pulse sequence by multiplying the frequency thereof by a rational fraction having a value less than unity. The apparatus comprises a plurality of pulse repetition frequency dividers, one of which is directly responsive to the pulse sequence and the others of which are responsive thereto via a plurality of respectively associated inhibiting gates. The dividers and the gates are alternately concatenated such that the pulse signal provided by each divider inhibits conduction of one input pulse to the next following divider.

3,605,026
APPARATUS FOR PROVIDING A PULSE TRAIN HAVING A MEAN FREQUENCY PROPORTIONAL TO A DIGITAL NUMBER

Keith Romilly Roskrudge Bowden, Bognor Regis, England, assignor to Rosemount Engineering Company, Ltd., Bognor Regis, England

Filed July 14, 1969, Ser. No. 841,242
Claims priority, application Great Britain, July 17, 1968, 34028/68
Int. Cl. H03k 1/16
U.S. Cl. 328—63 **11 Claims**

The apparatus provides a series of output pulses having a mean frequency in accordance with a digital input; such pulses may be used for controlling power, e.g. discrete cycles or half cycles of AC power, fed to a load. The digital number is put in a recycling storage medium, e.g. a shift register or delay line and, in one arrangement, a gate is arranged to pass or not pass a pulse from a pulse train according to one selected digit in each cycle of the storage medium, each digit

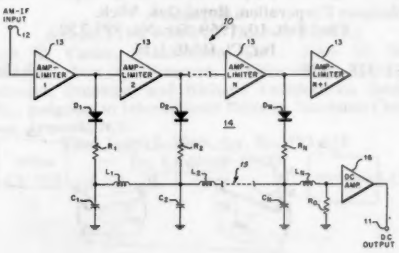


being selected, during a given time interval, for a number of times corresponding to the significance of the digit. With a shift register, it is more convenient to control the shifting by shift pulses such that each digit is put in an output stage, to control a gate, for a number of times in given time interval proportional to the significance of the digit.

3,605,027
LOG AMPLIFIER

Daniel R. Nichols, Linthicum Heights, and John O. Wedel, Baltimore, both of, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 19, 1969, Ser. No. 800,918
Int. Cl. G06g 7/24
U.S. Cl. 328—145 **2 Claims**



A log intermediate-frequency amplifier in which a voltage feedback circuit is used between the output and the input of a summing DC amplifier to provide a substantially low effective input impedance for the DC amplifier to eliminate the error caused by the possibility of back biasing of detector stages comprising part of the composite log amplifier.

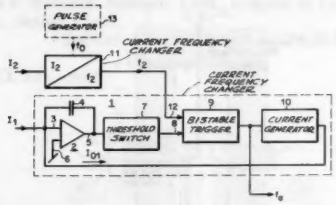
3,605,028
CIRCUIT ARRANGEMENT FOR THE MULTIPLICATION OF TWO VARIABLES

Jakob de Vries, Allenwinden, Switzerland, assignor to Landis & Gyr, A.G., Zug, Switzerland

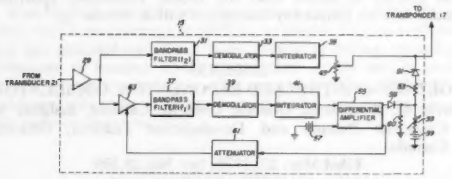
Filed Jan. 27, 1970, Ser. No. 6,202
Claims priority, application Switzerland, Jan. 30, 1969, 1402/69
U.S. Cl. 328—160 **10 Claims**

The invention relates to a circuit arrangement for multiplying two values, particularly for forming the product of

current and voltage, in order to measure real output, comprising a current frequency changer, which generates a sequence of output pulses at a pulse sequence frequency proportional to the product and which has an operational amplifier, the input of which is coupled to the output via a capacitor, a pulse produced by a current generator being supplied to the operational amplifier when a threshold switch downstream of the latter responds.

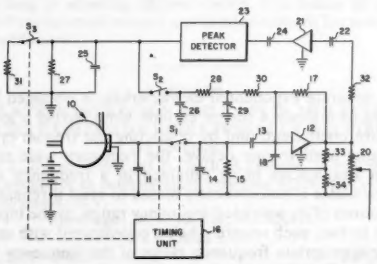


3,605,029
SIGNAL DETECTION APPARATUS
Nathan Freedman, West Newton, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed June 30, 1969, Ser. No. 837,627
Int. Cl. H04b *15/00*
U.S. Cl. 328—167 **2 Claims**



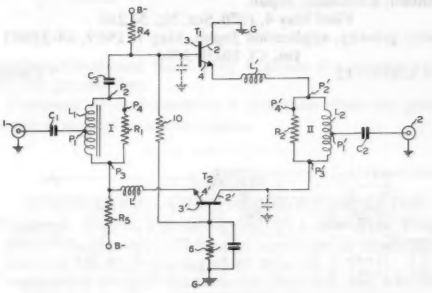
A receiver for use in a system in which randomly varying target-indicating signals from a transducer are detected in the presence of noise signals which may vary in amplitude between wide limits. Advantage is taken of the fact that the spectrum of frequencies of randomly varying target-indicating signals differs from the spectrum of frequencies of noise signals. Therefore, by appropriately multiplexing and filtering the signals from a transducer, separate signals proportional, respectively, to the root mean square value of noise signals and target-indicating signals may be derived and compared to produce an output signal which changes from one level to another when target-indicating signals are present.

3,605,030
HIGH SENSITIVITY AMPLIFIER WITH PEAK DETECTOR AND STORAGE MEANS
Marshall D. Elmore, Norwalk, Calif., assignor to Beckman Instruments, Inc.
Filed June 26, 1967, Ser. No. 648,765
Int. Cl. H03k *9/00;* **H03f** *3/68*
U.S. Cl. 329—104 **10 Claims**



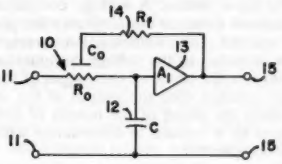
A high sensitivity electrometer employing a capacitor to accumulate an electronic charge over a relatively long period and a first switch for coupling the charge to an operational amplifier over a short period. An inverting capacitively coupled amplifier drives a storage circuit comprising a peak detector and memory capacitor. A second switch synchronized with the first switch couples the storage circuit to the operational amplifier through a filter network to apply the stored peak voltage in the memory capacitor as a direct coupled electrometer input signal.

3,605,031
WIDE-BAND LOW-DISTORTION ALTERNATING CURRENT AMPLIFIER
Ben H. Tongue, West Orange, N.J., assignor to Blonder-Tongue Laboratories, Inc., Newark, N.J.
Filed Sept. 4, 1969, Ser. No. 855,323
Int. Cl. H03f *3/68;* **H01p** *5/12*
U.S. Cl. 330—30 **5 Claims**



This disclosure deals with a wide-band low-distortion alternating current amplifier employing input and output hybrid couplers interconnected by two paths, one containing a grounded collector transistor circuit and the other a grounded base transistor circuit, or similar functioning circuits as employed with other types of electron relay devices.

3,605,032
ACTIVE RC NETWORKS
William J. Kerwin, Sunnyvale, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Continuation-in-part of application Ser. No. 714,295, Mar. 19, 1968, now abandoned. This application May 4, 1970, Ser. No. 31,885
Int. Cl. H03f *1/36*
U.S. Cl. 330—107 **7 Claims**



An active RC network formed by a voltage amplifier, a passive RC input circuit for the amplifier which circuit includes a distributed RC element, and a provision for positive feedback from the output of the amplifier to the input circuit. In one embodiment, a lumped capacitor is connected in shunt with the voltage amplifier whereby a pole of the network transfer function can be located at any desired position farther from the origin than a zero of the function. Another embodiment includes a lumped resistor, which is connected in shunt with the voltage amplifier, whereby a pole can be located at any desired position closer to the origin than the zero. In another embodiment, a pole is located simply by

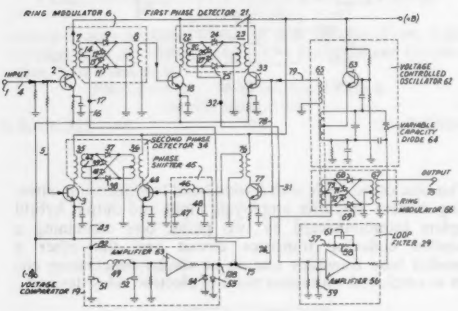
proper selection of the amplifier gain and the parameters of the distributed element; also the amplifier gain is always less than unity in this embodiment so that a very simple oscillator may be provided by location of the pole on the imaginary axis of the impedance plane. Still further embodiments provide for the distributed element to be advantageously divided into a plurality of sections. In view of the reduced gain requirements of the networks of this invention, the voltage amplifier may in many cases be a simple emitter follower, and an example of a network with such an amplifier is described. The networks may be connected in cascade to contribute separate factors in an overall response, and an example of the use of such cascaded networks to obtain a low-pass filter response is described.

3,605,033

PHASE-CONTROLLED OSCILLATOR FOR PRODUCING A STABILIZED PHASE OUTPUT

Hiroshi Nakamura, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 4, 1970, Ser. No. 34,210
Claims priority, application Japan, May 7, 1969, 44-35041
Int. Cl. H03b 3/04
U.S. Cl. 331—12 **7 Claims**



A phase-controlled oscillator has a loop comprising phase-detecting means, a loop filter connected to the phase-detecting means and a voltage-controlled oscillator connected to the phase-detecting means and the loop filter. The phase-detecting means compares an input signal with the output signal of the voltage-controlled oscillator. The phase-detecting means comprises a first phase detector coupling input means to the voltage-controlled oscillator. A second phase detector has a comparison phase which differs from that of the first phase detector by $\pi/2$ radians. The second phase detector is coupled to the input means. A voltage comparator coupled to the second phase detector discriminates the polarity of the output of the second phase detector. An inverter coupled to the first phase detector, to the voltage comparator and to the input means inverts the phase of the output of the first phase detector in accordance with the output of the voltage comparator and shifts the phase of the output of the phase-controlled oscillator by π radians in accordance with the output of the voltage comparator.

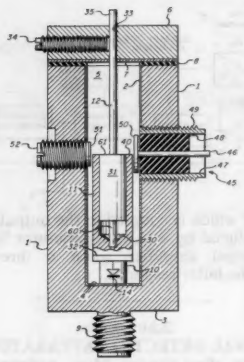
3,605,034

COAXIAL CAVITY NEGATIVE RESISTANCE AMPLIFIERS AND OSCILLATORS

Charles T. Rucker, Clearwater, and John W. Amoss, Jr., Dunedin, both of, Fla., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 28, 1969, Ser. No. 853,725
Int. Cl. H03b 7/14
U.S. Cl. 331—56 **21 Claims**

A semiconductor diode interiorly coupled to fields within a coaxial line cavity resonator serves as a negative resistance device, amplifying the high frequency fields present within the cavity. The combination forms a single port microwave amplifier or oscillator. A simple resistor, placed in the diode bias circuit in series with the diode, eliminates spurious modes of high frequency oscillation within the cavity.

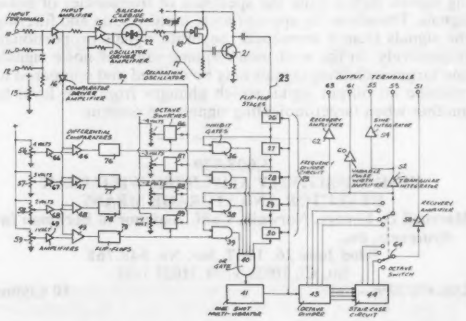


3,605,035

VOLTAGE-CONTROLLED EXPONENTIAL OSCILLATOR

David O. Rocheleau, Ottawa, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 27, 1970, Ser. No. 23,399
Int. Cl. H03b 3/04; H03k 3/26
U.S. Cl. 331—61 **4 Claims**

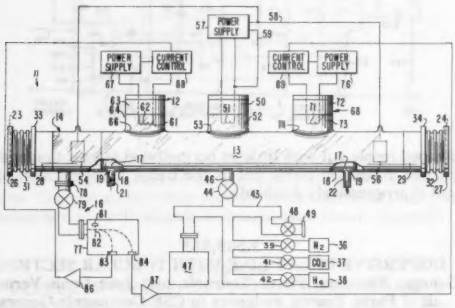


An accurate exponential characteristic is obtained by employing as a diode a silicon carbide lamp having a low temperature coefficient, and by restricting the frequency of the oscillator itself to one octave, the necessary wide range of output frequencies being obtained in a frequency divider. The oscillator is automatically biased to reset it repeatedly to the bottom of its restricted frequency range, as the input continues to rise, such resetting being coordinated with selection of the appropriate frequency range of the frequency divider in order that the output should continue to advance in frequency with the input voltage.

3,605,036
METHOD AND APPARATUS FOR THERMOCHEMICALLY CONTROLLING THE GAS ATMOSPHERE OF A GAS COHERENT RADIATION GENERATOR

Bruce E. Barnaby, Belmont, Calif., assignor to Laser Sciences, Inc., Bethel, Conn.

Filed Oct. 17, 1967, Ser. No. 675,983
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **17 Claims**

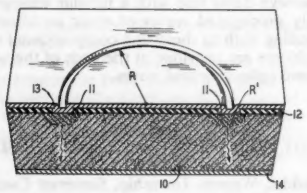


$CaCO_3$ is located inside the optical cavity of a CO_2 gas laser and is maintained at 680° C. to evolve CO_2 to replenish the gas atmosphere of the laser with CO_2 during operation. Titanium is located inside the optical cavity and is maintained at a temperature in the range of 700 to 900° C. to preferentially getter CO gas formed in the gas atmosphere of the laser during operation.

3,605,037
CURVED JUNCTION LASER DEVICES

Lucian A. D'Asaro, Madison, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed May 2, 1969, Ser. No. 821,282
Int. Cl. H01s *3/18*
U.S. Cl. 331—94.5 **7 Claims**



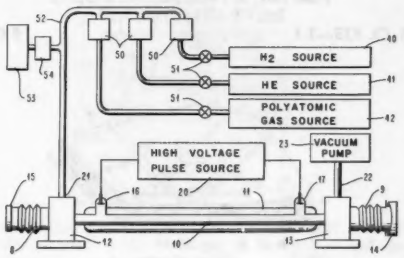
The specification describes an injection-type laser device in which the junction is formed in a curved configuration to form a ring or semiring shaped cavity. The radius of curvature of the ring must exceed a critical minimum for sustained laser oscillations.

3,605,038
POPULATION INVERSION AND GAIN IN MOLECULAR GASES EXCITED BY VIBRATIONALLY EXCITED HYDROGEN

Francis T. Byrne, and Carl F., both of Shelton, Silver Spring, Md., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,411
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 **12 Claims**

Population inversion and optical gain is obtained from a gaseous mixture which includes vibrationally excited hydrogen, helium, and a polyatomic molecular gas which has a resonant energy level near the first vibrational energy level of hydrogen, and which has allowed transitions to an intermediate vibrational level lying between the resonant level and the ground state.

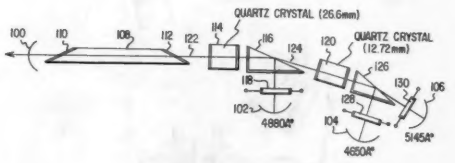


Coherent infrared emission is observed when the gaseous system is excited in a laser system.

3,605,039
MULTICOLOR LASER FREQUENCY SELECTOR

Thomas J. Harris, Poughkeepsie, N.Y., and Max Erhard, Baden-Wurttemberg, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 564,948, July 13, 1966.
This application Nov. 20, 1969, Ser. No. 871,708
Int. Cl. H01s *3/10*
U.S. Cl. 331—94.5 **8 Claims**



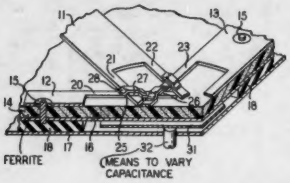
A laser cavity is formed by a partially transmissive output mirror and a plurality of reflecting mirrors. An ionized gas laser having Brewster angle windows is placed in the cavity. Spaced from one of the windows is a polarizing quartz crystal, the faces of which are coated with antireflective coatings. Adjacent to the quartz crystal is a right triangular birefringent prism having antireflecting coatings on two of its faces. The combined effect of the crystal and the prism is to disperse one laser wavelength along a path through an electro-optical crystal to a reflecting mirror. In addition, other laser wavelenths are transmitted to another quartz crystall and another birefringemt crusta; wjpse cp,bomed effect is to disperse a second laser wavelength along a path through an electro0optical crystal to another reflecting mirror. Other laser wavelengths are transmitted by the second birefringent crystal to another quartz crystal and birefringent crystal and from there additional respective electro-optical crystals and mirrors. When none of the electro-optical crystals is energized, the laser output beam will contain those wavelengths incident on the several mirrors. All other wavelengths capable of being generated by the laser are suppressed because of the losses introduced by the action of the quartz crystal and birefringent crystals. One or more of the several wavelengths may be removed from the laser beam by energizing the corresponding electro-optical crystal.

3,605,040

Y-JUNCTION CIRCULATOR WITH COMMON ARM CAPACITOR

Reinhard H. Knerr, Allentown, and Daniel J. Thibault, Whitehall, both of, Pa., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Nov. 3, 1969, Ser. No. 873,372
Int. Cl. H01p 1/32, 5/12
U.S. Cl. 333—1.1 5 Claims



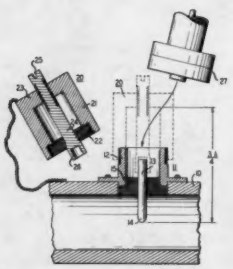
A Y-junction strip line circulator of the lumped constant type in which a single, common capacitor tunes symmetrically with the inductance of all three circulator arms. The capacitor may be fixed or may be electrically or mechanically variable to tune, adjust or switch the circulator.

3,605,041

PERMANENT WAVEGUIDE CONNECTION FOR OCCASIONAL USE

Robert W. Judkins, Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 31, 1969, Ser. No. 889,397
Int. Cl. H01p 1/16, 5/08, 7/06
U.S. Cl. 333—9 3 Claims



A coaxial coupling for connecting a test or other incidental signal with a waveguide by means of a probe within the guide is provided with a cavity forming cap so that when the connection is not in use and the cap is in place, the cap together with the probe forms a quarter wavelength shorted stub which renders the probe electrically invisible within the waveguide.

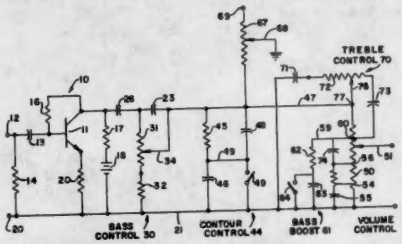
3,605,042

TREBLE CONTROL CIRCUIT

Earl E. Rapp, Decatur, Ill., assignor to General Electric Company

Filed Dec. 22, 1969, Ser. No. 887,114
Int. Cl. H03h 7/06, 7/10
U.S. Cl. 333—28 T 6 Claims

A treble tone control circuit in an audio amplifier comprising the series arrangement of a first capacitor connected to one of a pair of circuit input leads, a treble control potentiometer, and a second capacitor connected between the treble control potentiometer and a point on the volume control potentiometer of the amplifier. The wiper on the treble control potentiometer is connected to the other circuit input lead and a third capacitor is connected between the same point on the volume control potentiometer to which the second capacitor is connected and a second point on the volume control potentiometer. This circuit provides an increased treble cut with little or no midband attenuation and a greater maximum treble cut as the treble compensation circuit is progressively disabled.

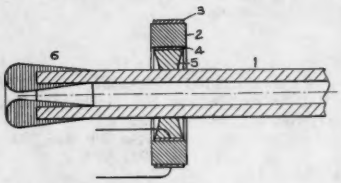


3,605,043

DISPERSIVE DELAY LINE WITH TUBULAR SECTION

Georges Bienvenu; Pierre Tournois, and Jean Louis Vernet, all of Paris, France, assignors to CSF Compagnie Generale de Telegraphie Sans Fil

Filed Mar. 21, 1968, Ser. No. 714,982
Claims priority, application France, Mar. 29, 1967, 100665
Int. Cl. H03h 7/30, 9/30; H01v 7/00
U.S. Cl. 333—30 11 Claims



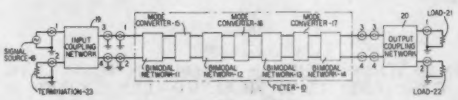
A dispersive delay line with a tubular waveguide wherein are axially propagated waves of sonic or ultrasonic energy corresponding both to shear and compressional modes; suitable transducers are provided at the ends of the waveguide for exciting and collecting said waves.

3,605,044

FILTER STRUCTURES USING BIMODAL, BISYMMETRIC NETWORKS

Harold Seidel, Warren Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Nov. 18, 1968, Ser. No. 776,398
Int. Cl. H03h 7/10
U.S. Cl. 333—73 R 8 Claims

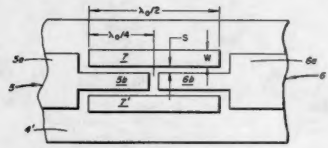


A variety of filter structures are synthesized by means of a cascade of bimodal networks. By including mode converters between adjacent pairs of networks, successive networks can be made to respond to one or the other of said modes. A transmission line filter and a coupler (channel dropping) filter are described.

3,605,045
WIDE-BAND STRIP LINE FREQUENCY-SELECTIVE CIRCUIT

Alan J. Ramsbotham, Jr., Greenbelt, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 15, 1969, Ser. No. 791,322
Int. Cl. H03h *7/04, 7/08;* **H01d** *3/08*
U.S. Cl. 333—73 S **10 Claims**

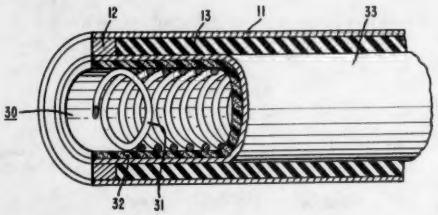


A wide-band frequency-selective microwave circuit having ground planes, dielectric layers, and conductive strip sections. The conductive strip sections are in the same plane and juxtaposed to each other to form resonant circuit elements.

3,605,046
DEFLECTION-FREE WAVEGUIDE ARRANGEMENT

Stewart E. Miller, Middletown Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Mar. 12, 1969, Ser. No. 806,663
Int. Cl. H01p *1/04, 3/12, 11/00*
U.S. Cl. 333—95 **3 Claims**



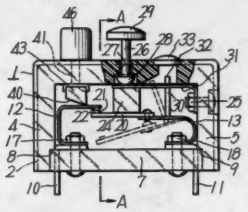
A waveguide transmission line comprising a series of sections, each section comprising a section of waveguide disposed within a section of a larger diameter rigid jacket and bound, under tension, at both ends of the jacket. This structure is used to substantially eliminate deflections in short sections of the waveguide. Advantageously, the space between the waveguide and the jacket is filled with a flexible material such as rubber or plastic foam to prevent sag due to gravitational force.

3,605,047
AUTOMATIC CIRCUIT BREAKER WITH MAGNETIC LATCHING MEANS

Yasuo Kasahara, Tokyo, Japan, assignor to Kabushiki-Kaisha Nakatani, Tokyo, Japan

Filed July 6, 1970, Ser. No. 52,847
Claims priority, application Japan, July 15, 1969, Dec. 8, 1969, 44/56270;44/98500
Int. Cl. H01h *9/16*
U.S. Cl. 335—1 **4 Claims**

A compact circuit protector comprises first and second conductive leaf springs secured in a casing at their one ends, which are held in contact with first and second terminals leading to the exterior of the casing. The leaf springs are bent toward each other, and a conductive, magnetic plate is secured to the second leaf spring and extend between the free ends of the leaf springs. First and second contacts are mounted on the free ends of the first leaf spring and the conductive, magnetic plate in opposing relationship. A permanent magnet carried by a third spring is arranged adjacent the magnetic plate to attract and hold it magnetically, thereby keeping the both contacts in engagement. An overcurrent through the magnetic plate across the terminals

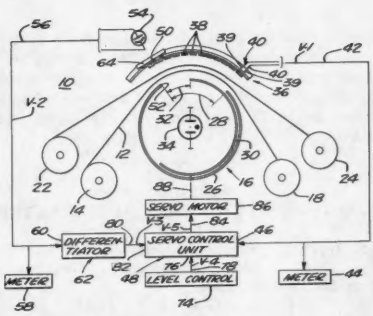


diminishes the magnetic attraction to move the plate away from the magnet by the resilience of the second leaf spring, providing the circuit interruption.

3,605,048
EXPOSURE CONTROL DEVICE FOR PHOTOGRAPHIC FILM PRINTERS

Ralph N. Sargent, III, Westwood, Calif., assignor to Michael H. Werner, Los Angeles, Calif.

Filed Aug. 29, 1968, Ser. No. 756,103
Int. Cl. G03b *27/78*
U.S. Cl. 355—83 **15 Claims**



A photographic film printer which includes a sensor assembly for monitoring light energy projected in series through segments of a pair of films. Light energy for exposing the print film is emitted through a light output printing aperture of adjustable width, as the film segments are drawn over the printing aperture. The sensor assembly includes a baffle plate positioned adjacent to and in alignment with the light output printing aperture. A plurality of light sensors are mounted on the baffle plate so that the sensors are aligned substantially across the maximum adjustable width of the printing aperture. A light detector assembly is also mounted on the baffle plate, and the light detector responds to light energy transmitted through a section of the printing aperture adjacent to a leading edge thereof. Control means respond to signals produced by the light sensors and the detector to adjust the width of the printing aperture as a preselected function of the printing light energy exposing the film print.

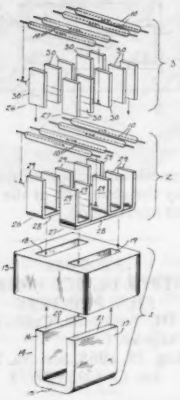
3,605,049
SEALED CONTACT RELAY

Wayne H. Wielebski, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Jan. 12, 1970, Ser. No. 2,023
Int. Cl. H01h *50/04, 50/08, 50/40, 51/28*
U.S. Cl. 335—152 **9 Claims**

A sealed contact relay has a plurality of sealed switches each enclosed in a modular cartridge. The relay structure has a U-shaped yoke made of magnetic material with two coils,

one surrounding each leg of the yoke. A set of spaced magnetic flux fingers extend from the end of each leg of the yoke and in the same general direction. The cartridges are removably mounted between the spaced flux fingers of each set and bridge across the magnetic gap between the two sets of flux fingers. An indicator cap is attached to the top of the

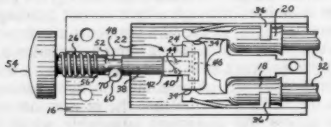


relay having a pivotally mounted indicator arm which swings away from a spring-biased position when the coils are energized. In another embodiment, a manual actuator is provided and has a magnet that can be moved into magnetic contact with the flux fingers to cause flux to flow in either direction through them.

3,605,050
QUICK-ACTING, SAFETY DISCONNECT ELECTRICAL SWITCH

Wayne E. Goldman, Lexington, and Edward D. Winkler, Reading, both of, Mass., assignors to Anderson Power Products, Inc., Boston, Mass.

Filed Apr. 3, 1970, Ser. No. 26,521
Int. Cl. H01h *9/20*
U.S. Cl. 335—164 **8 Claims**

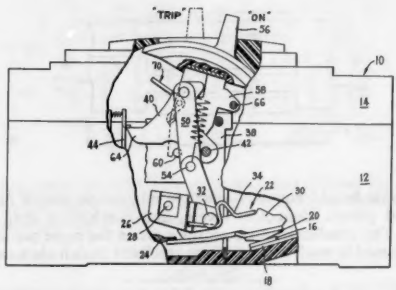


A quick-acting electrical switch which provides a positive means for disconnecting relatively high currents in a single conductor. Circuit connection is made between two switch contacts by a reciprocally movable, spring-loaded bridging assembly. When the bridging assembly is pushed into the "-Current ON" position, it is locked in position by a trigger-actuated latching mechanism. The bridging assembly will snap to the "Current OFF" position when the trigger is actuated either mechanically or by means of a solenoid. In the preferred embodiment, the latch mechanism engaging portion of the bridging assembly is free to rotate with respect to the latching mechanism to provide wear equalization. A plurality of the quick-acting switches can be stacked together with a common trigger for multiple pole requirements.

3,605,051
AVOIDANCE OF SWITCHING DEVICE FALSE OFF HANDLE INDICATION

Robert T. Casey, Southington, and Keith W. Klein, Simsbury, both of, Conn., assignors to General Electric Company

Filed Jan. 22, 1970, Ser. No. 4,835
Int. Cl. H01h *3/20*
U.S. Cl. 335—166 **4 Claims**

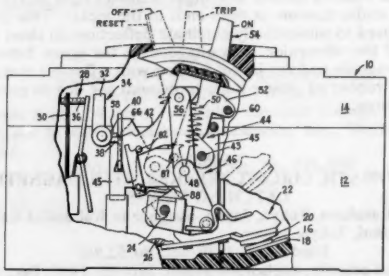


Auxiliary trip device usable with an electrical switching apparatus having a movable contact arm, an operating mechanism including a releasable cradle for moving the contact arm between open and closed circuit positions, and a manually actuatable handle operably connected to the operating mechanism and automatically movable to a trip position upon release of the cradle. The auxiliary trip device is movable responsive to movement of the handle toward OFF position for tripping the cradle when the contact arm is in closed circuit position for avoiding a false OFF handle indication.

3,605,052
AVOIDANCE OF SWITCHING DEVICE FALSE OFF HANDLE INDICATION

Herbert M. Dimond, West Hartford, and Keith W. Klein, Simsbury, both of, Conn., assignors to General Electric Company

Filed Jan. 22, 1970, Ser. No. 4,942
Int. Cl. H01h *3/20*
U.S. Cl. 335—166 **7 Claims**



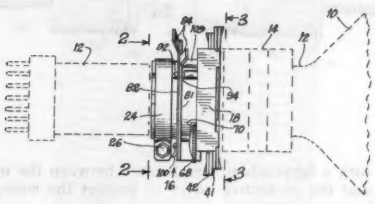
Switching apparatus having an operating mechanism including a releasable trip member or cradle for automatically opening relatively movable contact means, a manually actuatable handle movable between ON, OFF, and RESET positions for manually closing and opening the contact means and for resetting the cradle in a latched position and means preventing movement of the handle to the OFF or RESET positions when the contact means is in closed circuit position, to preclude a false OFF handle indication.

3,605,053

CONVERGENCE- AND PURITY-ADJUSTING DEVICE FOR COLOR TELEVISION PICTURE TUBE

Albert M. Anthony, Conneaut, Ohio, assignor to Tracor, Inc., Austin, Tex.

Filed Aug. 27, 1969, Ser. No. 853,387
Int. Cl. H01f 1/00
U.S. Cl. 335—212 18 Claims



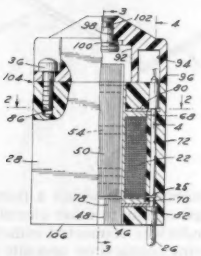
The convergence- and purity-adjusting device has a body adapted to be mounted around the neck of a color television picture tube. First and second slides are mounted on the body for movement in a direction perpendicular to the axis of the picture tube. Each slide carries three permanent magnets. The magnets on the two slides are mounted in corresponding positions, but are oppositely polarized. A drive is provided to move the slides in opposite directions. Such drive comprises a pinion rotatably mounted on the body. Racks are provided on the slides and are arranged to engage opposite sides of the pinion. A control knob is connected to the pinion. The purity-adjusting rings are mounted on posts, projecting from the body.

3,605,054

ENCAPSULATED ALTERNATING CURRENT SOLENOID

Louis R. Conrath, Lathrup Village, Mich., assignor to Detroit Coil Company, Ferndale, Mich.

Continuation-in-part of application Ser. No. 854,691, Sept. 2, 1969. This application Apr. 7, 1970, Ser. No. 26,241
Int. Cl. H01f 7/10
U.S. Cl. 335—243 14 Claims



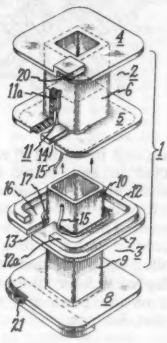
This disclosure relates to alternating current solenoids of the commercial industrial type, including a C-stack, a solenoid coil disposed within the C-stack and a plunger having a shank portion received within the coil passage, and wherein the conventional sideplates, baseplate, cover, backstop, assembly bolts or rivets and even the flanged coil bobbin may be eliminated. The C-stack and coil are encapsulated in a thermosetting resin block extending from the bight portion to the pole faces of the C-stack and between the C-stack and the coil, and the pole faces of the C-stack are exposed to allow abutment by the plunger. A cap encloses the operating spaced for the plunger head at the pole faces of the C-stack and is secured to the thermosetting resin block providing a completely enclosed solenoid unit. Vacuum encapsulation may be facilitated by utilizing an encapsulating cup which forms an integral part of the final product. The coil assembly is shown as having means for retaining, during the encapsulated process, electric terminals which are exposed in the final product for connecting the coil to a source of current.

3,605,055

TWO-PIECE WINDING BOBBIN FOR WATT-HOUR METER POTENTIAL COIL

James J. Grady, Somersworth, N.H., assignor to General Electric Company

Filed July 2, 1970, Ser. No. 52,021
Int. Cl. H01f 27/30
U.S. Cl. 336—185 16 Claims



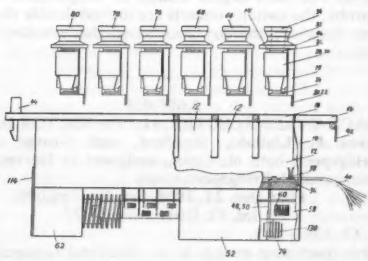
A winding bobbin for a watt-hour potential coil is formed of two flanged spools that are fitted together to make a unitary bobbin assembly. The two-piece bobbin arrangement is characterized by incorporating an insulated chamber between the adjacent spools when they are in their assembled position, thereby to afford an insulated passageway for connecting the respective electromagnetic coils wound on the two spools in a manner such that the voltage gradient between successive end turns of wire on each coil is reduced to approximately 50 percent of the end-turn gradient that would exist on a single-coil bobbin having an equal number of turns on its supported coil.

3,605,056

SWITCH PROTECTING DEVICE

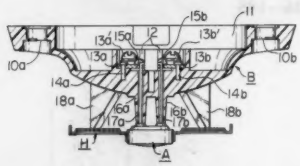
Kurt Tage Lennart Bergman, Sundsvall, Sweden, assignor to David O. Hagglund, Stockholm, Sweden

Filed June 4, 1968, Ser. No. 734,484
Claims priority, application Sweden, June 5, 1967, 7811/67
Int. Cl. H01h 85/56
U.S. Cl. 337—8 1 Claim



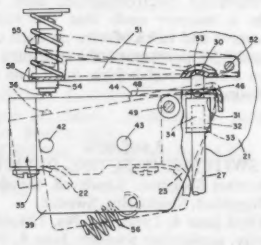
A combined switch-protecting and safety device has safety fuses which can be introduced separately into openings provided in a front wall of a casing, while a rear wall extending parallel to the front wall serves as a supporting plate for switch protective means the various parts of which are mounted on the outer side of the plate.

3,605,057
HEAT DETECTION UNIT
Hiroaki Mamiya, Osaka, Japan, assignor to Matsushita Denko Kabushiki Kaisha, Osaka, Japan
Filed Nov. 21, 1969, Ser. No. 878,858
Claims priority, application Japan, Nov. 25, 1968, Nov. 29, 1968, 102655/68;102656/68
Int. Cl. H01h *37/04, 37/52*
U.S. Cl. 337—380 3 Claims



A heat detection unit including in a sealed block a contact assembly connected to an electric driving circuit for fire alarm or extinguisher apparatus and adapted to be closed by self-turning or deforming action of an associated heat-sensitive bimetal element. The bimetal element is arranged to be thermally close contact with a sealing metal cap of the block having a heat-collecting plate member provided with a plurality of holes adapted to have circumferential heat collected at both surfaces of the plate and transmitted to the cap through the shortest distance.

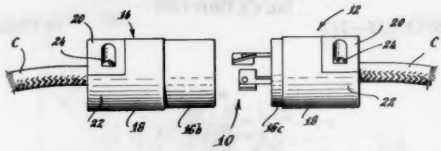
3,605,058
ULTRA SENSITIVE THERMOSTATIC SWITCH
Frank Reingruber, 60 Main St., Bartlett, N.H.
Filed Apr. 27, 1970, Ser. No. 31,985
Int. Cl. H01h *37/04, 37/48*
U.S. Cl. 337—386 5 Claims



A thermostatic switch of the elongated probe, pivoted microswitch, pivoted switch arm type uses only a single probe to double the travel of the switch button away from the arm. For each degree change of temperature sensed by the probe, the switch contacts are moved double the conventional distance, thereby increasing the sensitivity of the switch.

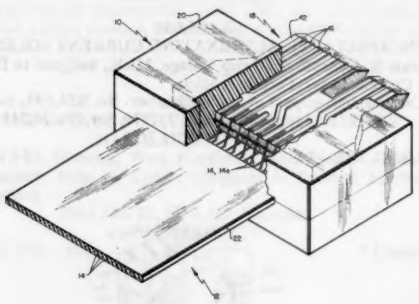
3,605,059
BACK-WIRED ELECTRICAL CONNECTOR DEVICE
Vincent F. Lipinski, Stratford, and George A. Riley, Bridgeport, both of, Conn., assignors to Harvey Hubbell, Incorporated, Bridgeport, Conn.
Filed Dec. 24, 1968, Ser. No. 786,698
Int. Cl. H01r *3/06, 33/72*
U.S. Cl. 339—14 L 3 Claims

This disclosure relates to an electrical connector device having terminal-contact members with terminal portions retained in cavities in an insulator body, each terminal portion having binding plates angularly disposed with respect to the axis of the device. Angularly disposed wire entry openings are provided in the insulator body to direct wire lead ends to the binding plate wiring areas. The terminal-contact members and the insulator body are formed with keying means to provide noninterchangeability of these members in the cavities, and a protective cover is secured to the insulator



body with a labyrinthian seal located between the insulator body and the protective cover to protect the wiring areas from foreign matter.

3,605,060
APPARATUS FOR TERMINATING ELECTRICAL RIBBON CABLE
Eberhardt P. Praeger, and Brian A. Wolfset, both of Framingham, Mass., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Aug. 5, 1968, Ser. No. 750,291
Int. Cl. H01r *13/50;* H05k *1/04, 3/34*
U.S. Cl. 339—17 F 14 Claims

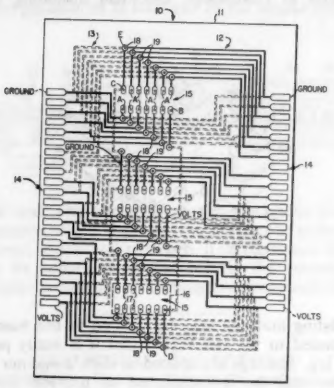


A new termination, with which a miniature ribbon cable can be connected readily to other electrical devices, has adjacent cable conductors connected without fan-out to a connector plate having contacts on opposite sides of a boardlike insulator. The cable insulation is removed from the conductors, prior to assembly of the cable with the connector plate, preferably along the entire conductor length that overlies the insulator.

3,605,061
PRINTED CIRCUIT BOARD
Orval J. Martin, Toledo, Ohio, assignor to The Reliance Electric and Engineering Company
Filed Sept. 9, 1968, Ser. No. 758,277
Int. Cl. H01r *13/50;* H05k *1/04*
U.S. Cl. 339—17 3 Claims

A printed circuit board and system. The board is of insulating material with circuit patterns secured to each side of the board and terminals emanating from the circuit patterns along two edges of the board. The system includes the board with a circuit or component connected by the circuit patterns to the terminals, a first connector interconnecting at least

two of the terminals at one edge of the board for internal circuit or component wiring, and a second connector connected



to at least two of the terminals at the other edge of the board for external wiring.

3,605,062

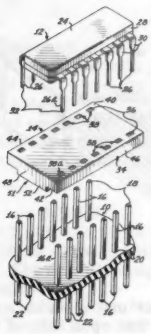
CONNECTOR AND HANDLING DEVICE FOR MULTILEAD ELECTRONIC ELEMENTS

William G. Tinkelenberg, and Dennis E. Rich, both of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed July 1, 1969, Ser. No. 838,286

Int. Cl. H01r *13/50;* **H02b** *1/06*

U.S. Cl. 339—17 CF **2 Claims**



A device adapted to facilitate the handling, storage, and shipping of a multilead electronic element. The device also provides a solderless demountable connector for attaching the element to a wiring panel.

3,605,063

SYSTEM FOR INTERCONNECTING ELECTRICAL COMPONENTS

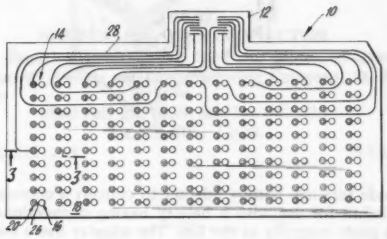
Marvin C. Stewart, 88 Harriman St., Hempstead, N.Y.

Filed Mar. 12, 1969, Ser. No. 806,407

Int. Cl. H01r *29/00*

U.S. Cl. 339—18 R **17 Claims**

A system for interconnecting electrical components. Individual components are mounted on the edge of cards having a matrix of paired conductive pads supported thereon. EAch pair of pads is electrically connected and one pad of each pair comprises a plated through hole to the other side of the card. Conductive paths provide electrical connection between the component leads and selected pairs of pads. Interconnection between components is accomplished through wiring cards which also support a matrix of paired conductive pads with one pad of the pair comprising a plated through hole to the other side of the card. Two types of wiring cards are used, one referred to as a vertical card in which all of the pad pairs in a vertical column are interconnected by conductive paths and the other referred to as a horizontal card in which all of the pad pairs in a horizontal row are interconnected by conductive paths. Alternate cards have plated through holes which are staggered. Electrical inter-



connection is accomplished by forming a stack of a component card, a vertical card, a horizontal card, another vertical card and another component card, compressing the stack to make electrical contact between the pad pairs of adjacent cards. Suitable electrical paths between components is accomplished by punching holes in the wiring cards to interrupt electrical connection between the pads of a pair or between pad pairs. In this manner, electricity may be conducted either through a card to the next card by means of the plated through holes or along the surface of the card by means of the conductive paths interconnecting pad pairs.

3,605,064

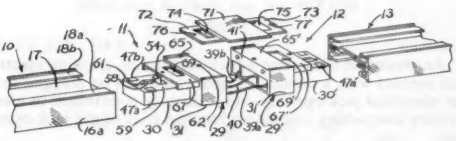
SPLICE BOX FOR A POWER DISTRIBUTION SYSTEM

Larry L. Routh, Castro Valley, and James Contratto, Livermore, both of, Calif., assignors to U.S. Industries, Inc., New York, N.Y.

Filed Dec. 3, 1968, Ser. No. 780,840

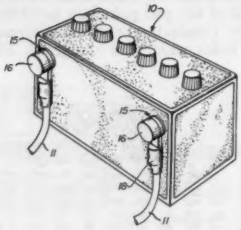
Int. Cl. H01r *9/02, 13/46, 19/54*

U.S. Cl. 339—21 R **11 Claims**



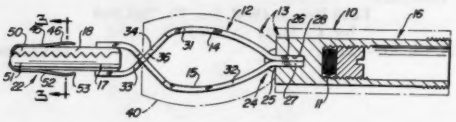
A splice box or coupler for a power distribution system of the type providing a substantially continuous convenience outlet enabling electrical plugs to be connected thereto at substantially any selected location therealong. The system includes one or more track components that provide such convenience outlet, and each such track component is equipped with a conductor assembly having a plurality of spaced-apart conductors. The splice box or coupler is connectable with such track component at an end thereof, and may be used either to join successive track components or to attach an end block or junction box thereto at which the conductors of the distribution system are connected with power supply lines. The splice box, for the purpose of establishing connection thereof with a track component, has a housing portion insertable into the end of a track component, and it is equipped with a plurality of contacts movable into engagement with the respective conductors of such track component when assembled therewith, and which contacts are selectively manipulatable to establish either a two-conductor single electric circuit or a three-conductor double electric circuit.

3,605,065
SIDE TERMINAL BATTERY ADAPTER
John K. Shannon, 6504 43rd Ave., Kenosha, Wis. 53140
Filed May 20, 1970, Ser. No. 39,077
Int. Cl. H01m *5/00;* **H01r** *11/00*
U.S. Cl. 339—28 R **6 Claims**



A side terminal battery adapter to convert a conventional installation for use with a battery having conventional terminal posts normally at the top. The adapter has a terminal clamp at one end proportioned to engage the conventional battery terminal post and is secured to an adapter cable of preselected length which terminates at its other end in an adapter-threaded end. The threaded end is characterized by an insulating skin, a nut embedded in its conductive central body portion, and an annular insulating face surrounding the connection proportioned to insulatingly and circumferentially compressibly engage a plastic collar on the side mount terminal of the installation.

3,605,066
ELECTRICAL CONNECTOR
Charles J. Vierck, Sr., P.O. Box 1036, Jupiter, Fla., and Charles Vierck, Jr., 404 N.E. 4th Ave., Gainesville, Fla.
Filed Mar. 14, 1969, Ser. No. 807,258
Int. Cl. H01r *29/00*
U.S. Cl. 339—32 R **10 Claims**

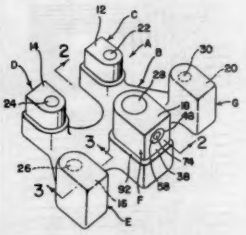


An electrical connector which establishes gripping electrical contact with a conductor and which can be plugged into an electrical jack opening and resiliently maintained in electrically conducting contact with boundaries of the jack opening.

The connector includes relatively movable gripping jaws urged together by biasing means whereby the jaws can grip a conductor inserted between them. At least one spring construction is disposed on an externally facing portion of the jaws for resiliently engaging a boundary of a jack opening and establishing electrical contact between the jaws and the boundary of the jack opening.

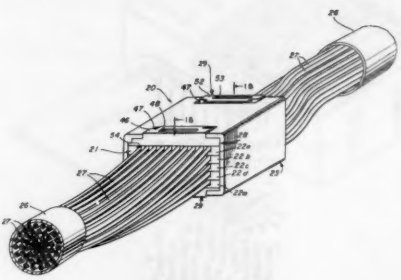
3,605,067
MULTIPLE CABLE ELECTRICAL CONNECTOR
Julius R. Szabo, and Richard P. Mott, both of P.O. Box 5000, Cleveland, Ohio 44101
Filed Oct. 25, 1968, Ser. No. 770,587
Int. Cl. H01r *13/44*
U.S. Cl. 339—36 **3 Claims**

A multiple cable electrical connector comprises a metallic body having a base portion and at least three spaced-apart legs extending upwardly from the base portion. The legs have axial recesses therein for receiving the ends of electrical conductor cables. Each leg has a lateral threaded bore intersecting the recess at substantially right angles and a setscrew is threadedly received in each bore. Each setscrew has an inner end received in the recess and a saddle clamp is mounted on the inner end of each setscrew in each recess. The base portion of the connector and at least one leg may be completely encapsulated in elastomeric electrical insulating material.



The insulating material may be bonded to the base portion and unbonded to the one leg so that it is easily peeled off from the leg. The legs are spaced in such a manner that two connectors may be interdigitated to provide double the number of available recesses while taking up very little additional space.

3,605,068
ELECTRIC COUPLER
Vincent A. Rayburn, Baltimore, Md., assignor to Western Electric, New York, N.Y.
Continuation-in-part of application Ser. No. 418,995, Dec. 17, 1964, now Patent No. 3,457,640. This application Apr. 21, 1969, Ser. No. 817,866
Int. Cl. H01r *25/00*
U.S. Cl. 339—49 **30 Claims**

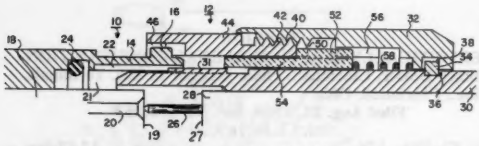


An electrical coupler unit includes a plurality of wafers which are stacked so that open slots of each of the wafers form contactor-receiving cells with associated portions of flat surfaces of adjacent wafers. A plurality of contactors are inserted into and locked within the cells formed by the stacked wafers and are formed with pockets for supporting the ends of associated conductors which are soldered thereto. Mating coupler units are assembled within supporting bands to facilitate the connecting of mating contactors of the units to form an electrical coupler.

3,605,069
RIGID ELECTRICAL CONNECTOR
Robert F. Dorrell, Des Plaines, Ill., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.
Filed May 26, 1969, Ser. No. 827,811
Int. Cl. H01r *13/54*
U.S. Cl. 339—90 R **20 Claims**

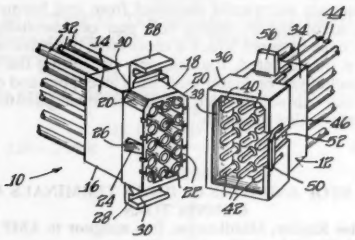
A connector which is adapted to maintain a substantially airtight seal between mating faces of a connector plug and receptacle by substantially preventing any relative movement between these elements. The connection is performed

through two means, the first of which is effective to loosely couple the plug and receptacle, and the second of which is effective to force the forward faces of insulating blocks in each of the elements against each other under pressure to cause a compression of at least one of the blocks resulting in



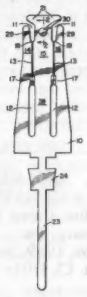
the desired seal. The compression of a block also provides a rigid connection which is resistant to movement under conditions of stress, shock and vibration. The resistance to movement may be enhanced by terminating the coupling in a metal-to-metal bottoming of the plug and receptacle shells.

3,605,070
ELECTRICAL CONNECTOR
Kerry M. Krafthefer, Downers Grove, Ill., assignor to Molex Incorporated, Downers Grove, Ill.
Filed May 5, 1969, Ser. No. 821,852
Int. Cl. H01r *13/54*
U.S. Cl. 339—91 R **3 Claims**



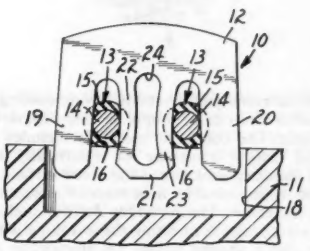
A plug and socket electrical connector comprising mating plastic housings and metal terminals housed therein. The housings are provided with interengaging latch members including an apertured tongue on one of the housings. Handle members are provided on the same housing for gripping by the thumb and middle finger while the latch is retracted by the index finger to separate the connectors.

3,605,071
TWO WIRE CLIP-TYPE TERMINAL AND TOOL FOR OPERATING SAME
William S. Sedlacek, Chicago, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.
Filed May 22, 1969, Ser. No. 827,013
Int. Cl. H01r *9/08*
U.S. Cl. 339—97 P **11 Claims**



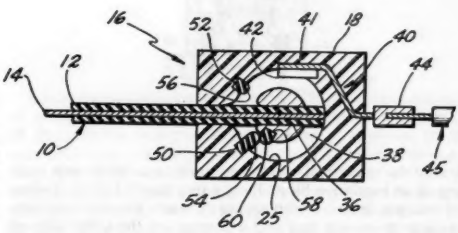
A clip terminal is made from resilient strip stock. It has two notches at its upper end which connect with narrow slots which separate the body portion into a center arm and two end arms. The width of each end arm is less than the width of the center arm so that the stiffness of the center arm is more than twice the stiffness of either end arm. The tool for inserting a wire in either slot has a recess which receives all three arms. The insertion of the wire deflects one end arm, but the side of the recess limits the deflection. The surfaces of the recess each have a groove to receive a boss formed on the center arm so that the deflection of either end arm will be limited independently of the other end arm.

3,605,072
SOLDERLESS WIRE CONNECTOR
Aelred Daniel Driscoll, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 28, 1969, Ser. No. 803,235
Int. Cl. H01r *11/20*
U.S. Cl. 339—98 **5 Claims**



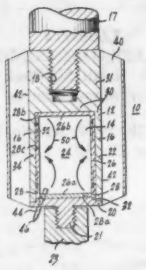
A solderless wire connector comprising a thin resilient flat plate contact element with parallel extended legs fitting into a grooved wire-supporting base and defining open-ended wire-receiving slots, wherein said legs are internally perforated to provide stress relief along wire-contacting edges.

3,605,073
CONNECTOR FOR FLAT CABLE
Ottomar H. Vetter, Minneapolis, Minn., assignor to United-Carr Incorporated, Boston, Mass.
Filed Sept. 5, 1969, Ser. No. 855,695
Int. Cl. H01r *9/08*
U.S. Cl. 339—99 R **7 Claims**



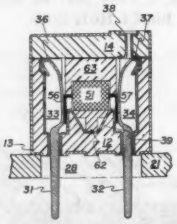
A flat cable having laterally spaced ribbon conductors embedded in its insulation is inserted into a plastic block containing a rotatable cylinder. The cylinder has a diametrically oriented slot for the reception of the inserted end of the flat cable. An annular space circumscribes the cylinder and a number of serrated contacts extend into the annular space so that when the cylinder is rotated the teeth on the contacts peel the insulation from the cable to establish electrical engagement with the ribbon conductors.

3,605,074
ELECTRICAL CONNECTOR ASSEMBLY HAVING COOLING CAPABILITY
Robert Alfred Freggens, Lancaster, and Willis Eugene Harbaugh, Leola, both of, Pa., assignors to RCA Corporation, New York, N.Y.
Filed Aug. 29, 1969, Ser. No. 854,160
Int. Cl. H01r 13/00
U.S. Cl. 339—112 8 Claims



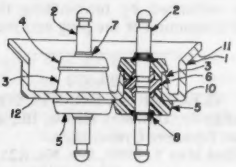
An electrical connector assembly having cooling capability and adapted to electrically couple an electrical device with a voltage source. The connector assembly includes a hermetically sealed hollow envelope of electrically conducting material, a capillary wick lining the inner surface of the envelope, and a vaporizable heat-transfer medium disposed within the envelope. The assembly further includes a first means for electrically connecting the envelope with the voltage source and a second means for electrically connecting the electrical device to the envelope, both the first and second means being in heat transfer relationship with the envelope, and heat dissipation means in heat-transfer relationship with the envelope.

3,605,075
MODULAR ELECTRICAL SYSTEM
Martin Alex Stofkooper, 17420 Ventura Blvd., Encino, Calif.
Filed July 1, 1968, Ser. No. 750,396
Int. Cl. H01r 9/22
U.S. Cl. 339—126 2 Claims



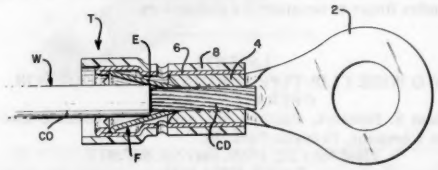
A modular electrical system comprising a basic unit consisting of an insulative block having two parallel rows of electrical receptacle holes with spring contacts therein terminating in a loop on one end and a contact on the other side of the insulative block, the loop side preferably extending above the block, the insulative block having a conductive coating forming a shield on five sides thereof, the receptacle holes carrying the spring loop contacts being adapted and dimensioned for receiving dual-in-line packaged electrical component leads with a cover thereover for depressing the loop portion of the spring contacts creating a higher pressure contact between the spring and the component which results in a low resistance connection between the component leads and the other end of the spring contact via a conductive coating on the receptacle hole wall and the spring contact itself, the cover in a multimodular system can be a printed circuit board having conductive portions contacting the top of the spring loop; a heat sink disposed between the components and a power bus running between the two rows of receptacle holes; a pair of collars extending from one surface of the insulated block being dimensioned for a press fit within an aperture of a mounting plate or board.

3,605,076
HERMETICALLY SEALED TERMINAL CONSTRUCTION
Hilliard Dozier, Cincinnati, Ohio, assignor to U.S. Terminals, Inc., Cincinnati, Ohio
Filed Aug. 21, 1969, Ser. No. 852,053
Int. Cl. H01r 9/20
U.S. Cl. 339—126 12 Claims



Hermetically sealed electrical terminals in which the conductor pins are electrically insulated from and hermetically sealed to a support by means of a pair of essentially rigid dielectric caps between which a distortable dielectric sealing member is incapsulated, the assembly permitting the use of highly conductive conductor pins, such as copper and copper alloys, which cannot be used in conventional glass-to-metal hermetically sealed terminals.

3,605,077
WIRE STOP AND WIRE GUIDE IN TERMINALS AND CONNECTORS
Karl Lester Kaylor, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Apr. 18, 1969, Ser. No. 817,396
Int. Cl. H01r 11/12, 11/08
U.S. Cl. 339—223 7 Claims

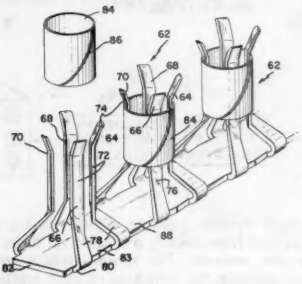


An electrical terminal for use in conjunction with thinly insulated wires and cables is disclosed. The terminal has funnel means therein to guide the conductors of the wires into place in the terminal wire barrels. The terminal has means therein to limit the forward insertion travel of the wire to assure that no wire insulation enters the wire barrel area. The funnel means provides strain relief means in a crimped connection where the wire joins the terminal.

3,605,078
CONTACT SOCKETS AND MANUFACTURING METHOD
Clarence Leonard Paullus, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 24, 1969, Ser. No. 801,436
Int. Cl. H01r 13/16
U.S. Cl. 339—259 23 Claims

Contact socket comprises four parallel contact arms arranged in surrounding relationship to the socket axis. Cylindrical spring surrounds the arms and, upon insertion of a

contact pin, resiliently urges them against the surface of the pin. Inner ends of arms are integral with a sheet metal strip from which they were formed. A strip of sockets is manufactured by blanking a stock metal strip to produce arms on



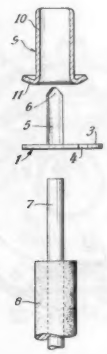
each side, these arms being later twisted and bent to produce any one of several types of socket strip including single or double rows of sockets on parallel spaced-apart axes and axially aligned contact sockets on opposite sides of the strip.

3,605,079

ELECTRICAL TERMINAL CONNECTIONS

Hans Wernhard Schneider, Castle Works, High St., Old Woking, Surrey, England

Filed Feb. 6, 1970, Ser. No. 9,328
Claims priority, application Great Britain, Feb. 13, 1969, 7895/69
Int. Cl. H01r *11/08*
U.S. Cl. 339—276 R **4 Claims**



An electrical contact assembly comprises an apertured tag through which the bare end of a conductive wire passes. A tang projects rearwardly from the aperture to lie alongside the wire and a sleeve surrounds the tang and wire. The sleeve is crimped to press the wire into conductive relationship with the tang and hence the tag.

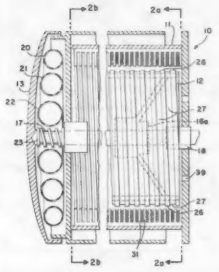
3,605,080

ELECTRODYNAMIC SONAR PROJECTOR

Frank R. Abbott, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 22, 1969, Ser. No. 887,202
Int. Cl. H04b *11/00*
U.S. Cl. 340—12 **10 Claims**

A compact, high-power, electromechanical transducer having a reduced inertia for efficient, low frequency transmission of sonar energy is provided, and includes a pair of coaxially disposed, cylindrically shaped members operatively connected to an outwardly facing projecting piston. DC conductors are mounted between radially inwardly projecting, helically configured ribs on the outer member and alternate with control current conductors, similarly disposed adjacent the radially inwardly projecting ribs, to electromechanically cooperate for attracting and repelling radially outwardly extending ridges carried on the inner cylindrical member and



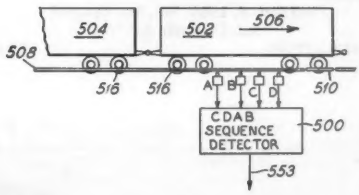
reciprocably displace the piston in accordance with the impressed alternating control frequency. Locating all the conductors on the outer stator shell member and constructing the inner armature member of a lightweight fiber glass material mounting small radially outwardly projecting ridge portions, provide a transducer having a minimal inertial resistance to bidirectional excursions ensuring an efficient distortion free transmittal of acoustic energy.

3,605,081

SEQUENCE DETECTOR FOR RAILWAY VEHICLE CONTROL SYSTEM

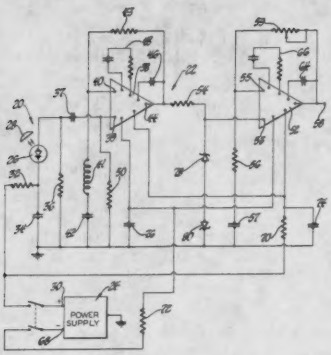
Lawrence A. Tonies, Grayslake, Ill., assignor to Mangood Corporation, Grayslake, Ill.

Filed Feb. 27, 1970, Ser. No. 15,141
Int. Cl. G06f *7/02*
U.S. Cl. 340—23 **6 Claims**



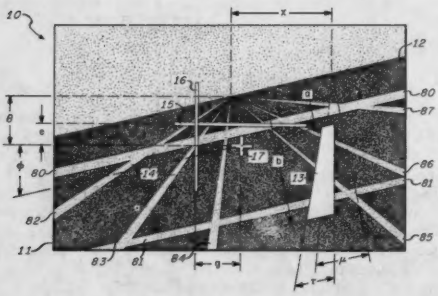
An axle sequence detector for detecting a unique sequence of actuation of four railway track switches or actuators. Of all the possible sequence combinations, it responds to only one, actuating a sequence identification signal in response to that one sequence. It disregards all the other possible sequences. One application is given where axle detectors are arranged along the line of movement of a train, the sequence detector identifying a unique activation of the axle detectors in the order of "3rd + 4th + 1st + 2nd." Initially, the output lines of all switches or activators except the 3rd are blocked by control gate means. Actuation of the 3rd track switch unblocks a circuit containing the 4th track switch. Actuation of the latter unblocks the 1st track switch and renders the 3rd track switch circuit nonconductive. Actuation of the 1st track switch unblocks the 2nd track switch circuit and renders the 4th track switch circuit nonconductive. Actuation of the 2nd track switch triggers a sequence output signal and renders the 1st track switch nonconductive. Any other sequence commands circuit reset and start over.

3,605,082
INTRUDER DETECTION SYSTEM
David R. Matthews, Ann Arbor, Mich., assignor to Laser Systems Corporation, Ann Arbor, Mich.
Filed Apr. 16, 1969, Ser. No. 816,727
Int. Cl. G08b *13/18*
U.S. Cl. 340—258 20 Claims



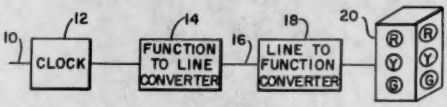
An intruder detection system of the type employing a transmitter for producing a continuous train of radiant energy pulses and a receiver which is spaced from the transmitter and in the line of sight thereof to define a monitored area. The receiver controls an alarm device in such a fashion that the alarm device remains inactive as long as pulses continue to be received but which becomes active if the pulse train is interrupted either by means of an intruder in the line of sight or by an attempt to defeat the system with a continuous radiant energy source focused on the receiver.

3,605,083
ATTITUDE AND FLIGHT DIRECTOR DISPLAY APPARATUS UTILIZING A CATHODE-RAY TUBE HAVING A POLAR RASTER
Melvin G. Kramer, Riverton, Wyo., assignor to Sperry Rand Corporation
Filed Oct. 8, 1969, Ser. No. 864,815
Int. Cl. G08g *5/02*
U.S. Cl. 340—27 NA 22 Claims



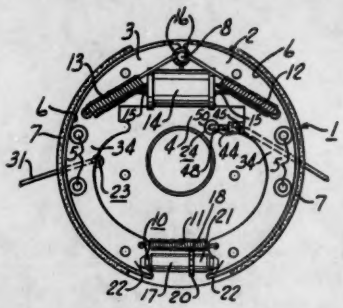
Apparatus for providing a contact analog display on a cathode-ray tube representing the horizon, ground plane grid lines in perspective, and a runway or other flight path reference in perspective, by intensity modulating the electron beam of the cathode-ray tube while it traces out a spiral raster. Center reference indicia and flight director bars may be generated during the retrace time of the raster.

3,605,084
APPARATUS FOR DIGITAL CONTROL OF TRAFFIC CONTROL TIMERS
John Matysek, Crozet, Va., assignor to Remote Controls Corporation
Continuation-in-part of application Ser. No. 826,212, May 20, 1969. This application Oct. 2, 1969, Ser. No. 863,309
Int. Cl. G08g *1/07*
U.S. Cl. 340—40 8 Claims



A traffic control system utilizing digital timing signals, which can be derived from locally available 60 hertz power, to time each traffic interval. The timing signals are transformed to pulses marking the initiation of each traffic interval. These in turn are converted into signals which can be transmitted, for example via two pair of electrical conductors, from a remote traffic guidance center to a local traffic controller in which they are reconverted to signals for each traffic phase. These phase signals are then steered to switching circuits which control energization of the traffic signal indicators. The timing circuit can be utilized independently as a cyclic timer, either with or without conversion for transmission to a remote location.

3,605,085
BRAKE LINING WEAR DETECTION MEANS
John L. Fiorita, Box 58 Rd #2, Cheswick, Pa., and Harold H. Shaffer, Jr., 613 Saxonburg Rd., Pittsburg, Pa.
Filed Aug. 18, 1969, Ser. No. 850,752
Int. Cl. B60q *1/44*
U.S. Cl. 340—52 A 9 Claims

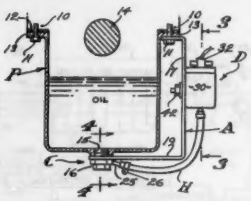


Brake lining wear detection means to indicate when the brake lining on a motor vehicle brake assembly, either the conventional type or disc type, has worn to a preselected wear limit indicative of replacement wherein there is provided limit switch means in the detection circuit and mounted on the vehicle brake assembly in adjacent spaced relation relative to a brakeshoe in the brake assembly to operate the detection circuit when the brake lining wear has reached the preselected wear limit.

3,605,086
OIL LEVEL INDICATOR
Matej Karl Triska, Box 240 Woodglen Rd., Glen Garden, N.J.
Filed Apr. 23, 1969, Ser. No. 818,702
Int. Cl. B60q *1/00*
U.S. Cl. 340—59 4 Claims

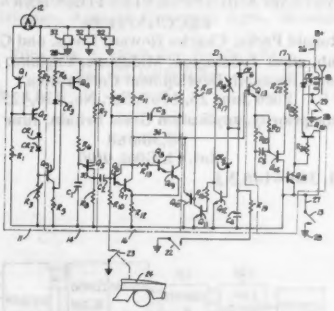
An oil level indicator that detects the level or insufficiency thereof in an engine crankcase or the like. Internal com-

bustion engines and in particular automotive engines cannot be inspected during operation for detecting the level of lubricating oil therein. And, since it is imperative that a sufficiency of oil be maintained therein despite whatever malfunction might cause the loss of oil, this invention provides an apparatus in the nature of an attachment that adapts to the crankcase of any usual internal combustion engine, so as



to reflect the oil level therein and to provide a signal in the event that said level is insufficient. More particularly, the apparatus is adaptable to existing crankcase openings and fastening points, and provides for adjustability in order to be suited for any prescribed insufficiency as circumstances require. Preferably an electrical contact is made that operates a lighted signal which warns the vehicle operator.

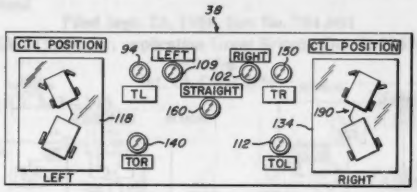
3,605,087
VEHICLE ALARM SYSTEM
Philip L. Nine, Indianapolis, Ind., assignor to Curtis Dyna-Products Corporation, Westfield, Ind.
Filed Aug. 6, 1969, Ser. No. 847,922
Int. Cl. B60r *25/10*
U.S. Cl. 340—64 **14 Claims**



A sensitive current detector includes the vehicle ammeter and is responsive to current therein to activate a first pulser which sets a monostable multivibrator which activates another pulser having an output to the vehicle horn relay to sound the horn at a 2-cycle per second (Hz.) frequency. The monostable multivibrator resets after 1 minute of sounding of the horn to deactivate the horn unless the current detector continues to sense current. A delay timer responds to a key-operated switch or a remote disable switch to inhibit, for 15 seconds, activation of the sound pulser by the monostable. The monostable multivibrator can also be set by mechanically operable switches.

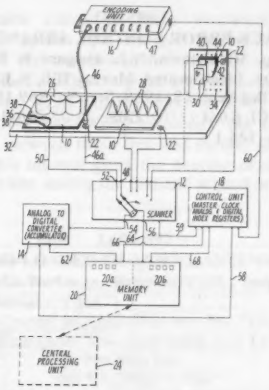
3,605,088
VEHICLE TRAILER ANGULAR POSITION INDICATOR
Joseph A. Savelli, 589 Magie Ave., Fairfield, Ohio
Filed Dec. 3, 1969, Ser. No. 881,702
Int. Cl. B60q *1/26*
U.S. Cl. 340—70 **16 Claims**

Apparatus for assisting the driver of a tow vehicle in moving a trailer vehicle in a reverse or backup direction. The apparatus of this invention particularly relates to a tow vehicle and a trailer vehicle which are pivotally attached one to the other. The apparatus of this invention includes means which sense and indicate the angular position of the trailer vehicle



with respect to the tow vehicle and which also includes means which sense and indicate the angular position of the front wheels of the tow vehicle to assist the driver of the tow vehicle in reverse movement of the trailer vehicle.

3,605,089
PHYSICAL INVENTORY SCANNING AND RECORDING SYSTEM
George W. Gray, Boise, Idaho, assignor to J.A. Terteling & Sons, Boise, Idaho
Filed July 14, 1969, Ser. No. 841,496
Int. Cl. G06f *3/05*
U.S. Cl. 340—172.5 **12 Claims**

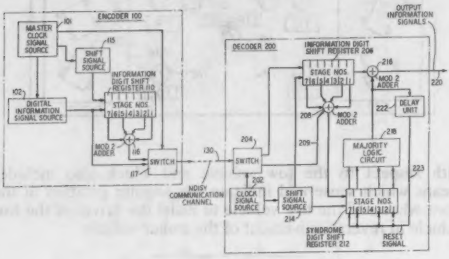


In the system, the weight of items physically present in defined increments of inventory placed on electrical transducer units continuously responsive to the weight of those items is sequentially monitored to provide a record of current inventory. The outputs of the weight-responsive transducer units are translated into signals representing the weight of the inventoried items and this information is stored in a computer accessible memory bank or other storage media, i.e. magnetic tape, paper tape, disc storage, etc. Provision may optionally be included to selectively impart identifying data to the transducer signal for storage along with the corresponding inventory weight through the use of a signal generating encoder which selectively attaches to the system at the site of the respective transducer units.

3,605,090
DECODER FOR CONVOLUTIONAL SELF-ORTHOGONAL ERROR-CORRECTING CODES
Herbert O. Burton, Little Silver, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.
Filed Apr. 16, 1969, Ser. No. 816,605
Int. Cl. G06f *11/12*; **G08c** *25/00*
U.S. Cl. 340—146.1 **5 Claims**

An error-correcting decoder for convolutional self-orthogonal codes includes a multistage syndrome register. A

majority logic circuit is connected to selected stages of the register. If, during the decoding process, the logic circuit senses that a majority of the selected stages contain "1" signals, the circuit generates a correction signal that is utilized to invert the information digit currently being processed. Circuitry is provided responsive to such a correction signal for resetting to "0" all the selected stages of the syndrome register. In this way the undesirable error propagation characteristic of a conventional feedback decoder is significantly improved.

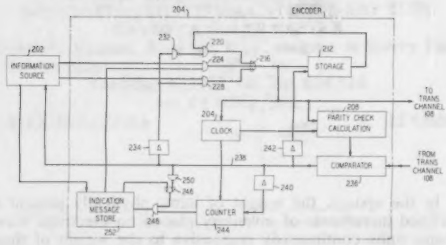


3,605,091

FEEDBACK ERROR CONTROL ARRANGEMENT

Shih Y. Tong, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 18, 1969, Ser. No. 859,107
Int. Cl. G06f *11/10*; G08c *25/02*; H04l *1/10*
U.S. Cl. 340—146.1 20 Claims



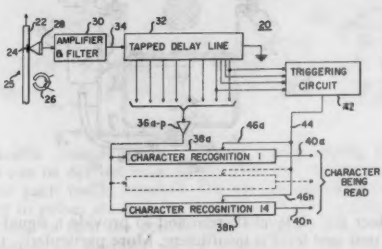
A feedback error control arrangement for data transmission systems which have both forward and reverse channels is disclosed. Parity check digits for an information message are generated at a transmitting terminal and stored there while the information message only is transmitted via the forward channel to a receiving terminal. At the receiving terminal, parity check digits for the information message are again generated and sent back via the reverse channel to the transmitting terminal where they are compared with the parity check digits stored. If the parity digits agree, the next information message is transmitted. If they disagree, the first information message is retransmitted and a record is kept of the position in the data train of the retransmitted message. After all information messages have been sent, the record information is transmitted. Upon receipt of this information, the receiving terminal rewinds the tape and in accordance with the record information, sequentially locates and erases the incorrect messages.

3,605,092

MAGNETIC INK CHARACTER RECOGNITION SYSTEM

Harold S. Richard, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Jan. 19, 1970, Ser. No. 3,689
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 C 15 Claims



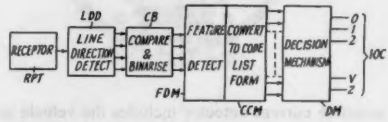
A triggering circuit is provided with an MICR character reader which enables the character recognition circuits during the time the analog waveform provided by a transducer reading head is properly positioned in a tapped delay line. The triggering circuit is responsive to the signals appearing at certain of the tapped outputs of the delay line, and a comparator included therein allows the character recognition circuits to be enabled when the voltage at the most delayed tap is a certain percent of the highest voltage appearing at the other taps coupled to the triggering circuit.

3,605,093

SYSTEMS AND APPARATUS FOR CHARACTER RECOGNITION

John Ronald Parks; Charles Howard Davis, and Gerald Owen Plumb, all of Teddington, Middlesex, England, assignors to National Research Development Corporation

Filed June 25, 1969, Ser. No. 836,425
Claims priority, application Great Britain, June 25, 1968, 30,306/68
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 J 20 Claims

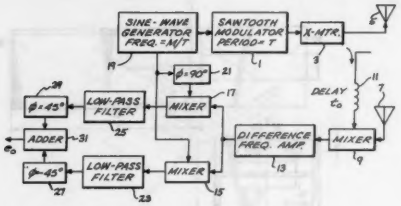


System and apparatus for recognizing both handwritten and machine-printed character patterns in which the character filed is scanned by photoelectric means to generate an analog-form signal which is converted into a four-bit binary form and fed to a four-bit parallel shift register from which differently delayed versions are taken to summing circuits in the development of *n*-tuples which operate to detect the presence of short line segments of specific orientation within the character area. By means of further summing circuits the line segment responses are analyzed to identify and indicate the position of a number of different topographical features such as line endings, bends or corners, line junctions and line crossings. These feature responses are converted into a list of code signals for matching, as by computer, with standard lists of similar code signals derived from ranges of different standard characters.

3,605,094
FREQUENCY MODULATED RANGING DEVICE

Salvador J. Peperone, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of Army

Filed Dec. 18, 1969, Ser. No. 886,274
Int. Cl. G01s 9/24
U.S. Cl. 343—14 2 Claims

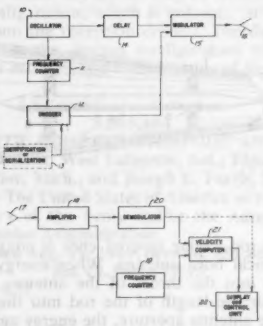


A frequency-modulated continuous-wave radar system virtually insensitive to targets beyond a predetermined range utilizes a delayed sample of the transmitted energy to mix with the reflected energy received. The mixer produces a difference frequency which is then separately mixed with quadrature components of the continuous wave carrier. The resultant signals are filtered to remove all but the Doppler components and then combined to yield a Doppler signal representing a target within the desired range.

3,605,095
DEVICE FOR MEASURING RELATIVE VELOCITIES

Robert A. Higgins, Apt. 34 Hawerysh Apts., Brookings, S. Dak.

Filed Oct. 1, 1969, Ser. No. 862,742
Int. Cl. G01s 9/44
U.S. Cl. 343—112 S 8 Claims

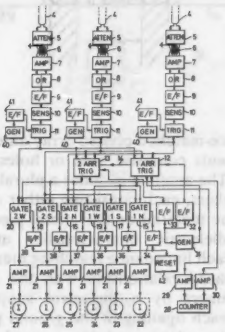


An electronic device for determining the relative speed between two units—vehicles or the like—by utilizing the Doppler effect. A transmitter would be located in one vehicle to transmit on a given frequency but also to transmit an encoded number corresponding to the transmitting frequency. The receiver, by detection of the shift between the coded number and the received frequency would determine the relative speed between the transmitter and the receiver.

3,605,096
NUCLEAR EXPLOSION DIRECTION INDICATOR

Reginald Allan Fothergill; William Harold Sellek, and Kenneth George Norman, all of Basingstoke, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Sept. 23, 1968, Ser. No. 761,601
Claims priority, application Great Britain, Oct. 3, 1967, 45065/67
Int. Cl. G01s 3/50
U.S. Cl. 343—113 8 Claims

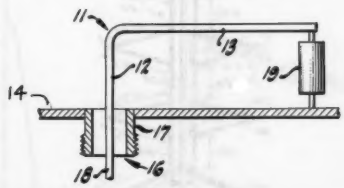


The indicator comprises three nondirectional aerials located at the apexes of a triangle, preferably equilateral, which receive the transient radiofrequency signal radiated from the explosion. These signals are fed to trigger circuits and coincidence gates which determine which of the three aerials were first and second to receive the transient. The time interval between these first and second arrivals is also measured. This interval gives the bearing of the explosion relative to the line joining the first and second arrival aerials.

3,605,097
END-LOADED FILAMENT ANTENNA

Endre B. Hadik-Barkoczy, Belmont, Calif., assignor to Textron Inc., Belmont, Calif.

Continuation-in-part of application Ser. No. 725,987, May 2, 1968, now abandoned. This application July 14, 1969, Ser. No. 841,210
Int. Cl. H01q 11/02
U.S. Cl. 343—739 9 Claims



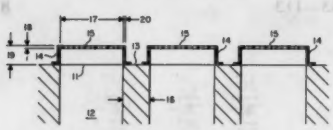
This invention relates to an electrically small antenna having a directional radiation pattern. The invention is physically embodied as a small filament, extending upwardly from a ground plane into connection with the top of a small passive resistor in turn extending downwardly to the ground plane. This filament lies in a single plane and produces linearly polarized radiation in such plane, with maximum radiation in a predetermined direction in such plane and elliptically polarized radiation in other planes but still with maximum radiation in a single direction.

3,605,098

PHASED ARRAY ANTENNA INCLUDING IMPEDANCE MATCHING APPARATUS

Peter W. Hannan, Centerport, N.Y., assignor to Hazeltine Corporation

Filed Apr. 14, 1969, Ser. No. 815,566
Int. Cl. H01q 3/26, 13/00
U.S. Cl. 343—771 11 Claims



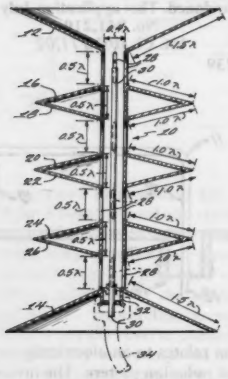
An impedance-matched phased array antenna in which the radiating elements comprise slots or holes in a conductive ground plane. The antenna includes a plurality of impedance-matching members, each consisting either of a thin sheet of high-*k* dielectric material or thin metal pieces which collectively have dielectric characteristics at the operating wavelengths. Each impedance matching member is supported in laterally spaced relationship with the other impedance matching members by a dielectric support member associated with each opening in the ground plane. Each combination of impedance-matching member and support member provides environmental protection for one of the openings in the ground plane. The lateral spacing between the impedance-matching members prevents accumulation of large sheets of water in front of the radiating elements which could cause severe impedance mismatches. Alternative arrangements are also covered.

3,605,099

PHASED SLOT ANTENNA ARRAY WITH FRUSTOCONICAL REFLECTOR

Howard E. Griffith, P. O. Box 547, West Monroe, La.

Filed Aug. 14, 1969, Ser. No. 849,969
Int. Cl. H01q 13/10
U.S. Cl. 343—771 10 Claims



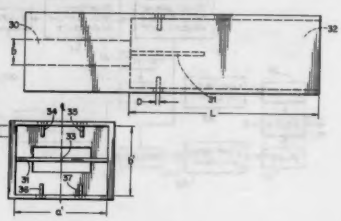
An antenna for omnidirectional or directional transmission. The antenna comprises a central member for supporting at least one pair of spaced frustoconical reflector elements. The support member is slotted between the reflector elements to serve as an energy radiator. Energy is supplied to the radiator by connecting adjustable probes between the slots and a central conductor within the support member.

3,605,100

ELECTRICALLY SCANNED TRACKING FEED

Leonard I. Parad, Framingham, Mass., assignor to Sylvania Electric Products, Inc.

Filed Aug. 28, 1969, Ser. No. 853,704
Int. Cl. H01q 13/00
U.S. Cl. 343—777 5 Claims



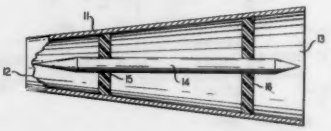
Apparatus for electrically scanning a radio frequency tracking feed beam employing a feed in which the phase center of the beam is located at the aperture. Two lobes with 180° phase reversal are provided in both azimuth and elevation by exciting the feed in the higher order modes, typically the TE_{20} mode for azimuth and the hybrid $TE_{11}+TM_{11}$ mode in elevation. Sequentially lobed tracking is obtained by moving the phase center to the left and the right of the focal axis of the feed for azimuth tracking and above and below the focal axis for elevation tracking.

3,605,101

DUAL MODE CONICAL HORN ANTENNA

Nicholas J. Kolettis, Morristown, and Elliott R. Nagelberg, Summit, both of, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 30, 1969, Ser. No. 862,352
Int. Cl. H01q 13/00
U.S. Cl. 343—783 2 Claims



A circular rod having tapered ends is coaxially mounted within a conical horn antenna. When energy in the TE°_{11} mode is fed into the throat of the antenna, it transforms smoothly over the length of the rod into the hybrid HE°_{11} mode. At the antenna aperture, the energy again transforms and this time appears in correctly phased TE°_{11} and TM°_{11} modes.

3,605,102

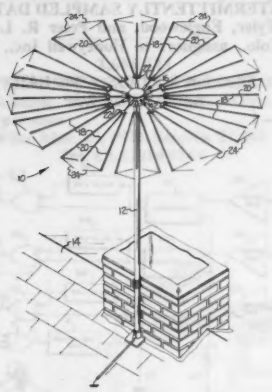
DIRECTABLE MULTIBAND ANTENNA

Talmadge F. Frye, 817 Lewis St., Asheboro, N.C.

Filed Mar. 10, 1970, Ser. No. 18,209
Int. Cl. H01q 3/24, 21/26
U.S. Cl. 343—797 13 Claims

An electrically directable antenna having a plurality of radially extending dipole rods which may be selectively inter-

connected to provide various directivity patterns. In addition, various pairs of dipole rods within each directivity pattern



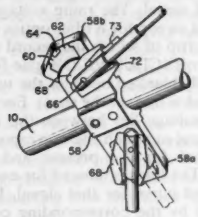
may be selected such that optimum reception is obtained in each of a plurality of widely separated broadcast bands.

3,605,103

BRACKET FOR ADJUSTING DIPOLE ELEMENTS OF A TV RECEIVING ANTENNA

Sylan Simons, 74 Greenwich Ave., Glenville, Conn.

Filed May 1, 1969, Ser. No. 821,032
Int. Cl. H01q *21/12*
U.S. Cl. 343—812 **3 Claims**



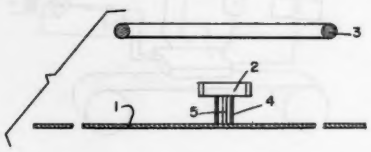
A bracket for adjusting the dipole elements of a TV receiving antenna in which the dipoles may be selectively placed in a straight configuration, which is colinear, or in a V-shape depending upon the reception desired. The dipoles may be either preset in the desired configuration or changed in place, without necessitating a disassembly of the antenna.

3,605,104

PARASITIC LOOP COUNTERPOISE ANTENNA

Vaughan H. Weston, West Lafayette, Ind.; Dipak L. Sengupta, Ann Arbor, Mich., and Joseph E. Ferris, Saline, Mich., assignors to The United States of America as represented by the Secretary of the Army and/or the Administration of Federal Aviation Administration

Filed Aug. 19, 1969, Ser. No. 851,404
Int. Cl. H01q *19/10*
U.S. Cl. 343—837 **3 Claims**



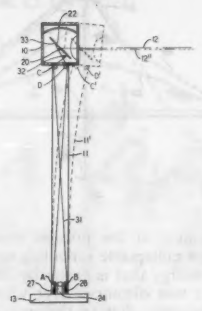
An antenna system comprising an active radiating element, such as an Alford loop, for radiating electromagnetic energy, a surface positioned below the radiator element to form a ground plane or counterpoise, and one or more passive parasitic loop elements positioned above the radiator so that the radiation from the parasitic elements is of a magnitude and polarity to cancel the radiation field below the plane of the counterpoise.

3,605,105

STABILIZER FOR REFLECTOR OF A POLE-MOUNTED ANTENNA

Arno A. Penzias, Highland Park, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 17, 1969, Ser. No. 867,181
Int. Cl. H01q *1/12*
U.S. Cl. 343—839 **9 Claims**



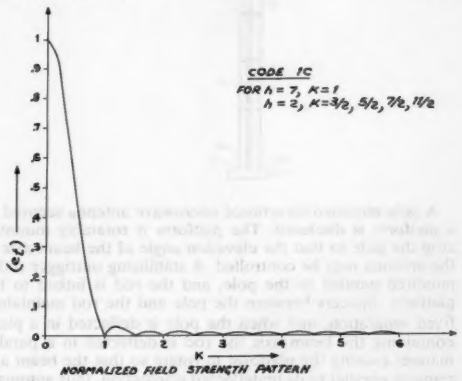
A pole-mounted directional microwave antenna having a plane reflector is disclosed. The antenna package mounted atop the pole contains a reflector which is rotatable in elevation angle providing control of the direction of the axis of propagation. A flexible belt within the pole is run between pivots at the top and bottom of the pole so that deflection of the pole in a plane containing the axis of propagation varies the separation between the pivots and affects movement of the belt. This movement is translated by a mechanical linkage to rotation of the reflector so that the resultant axis of propagation remains parallel to its undeflected orientation, thus automatically compensating for wind-induced pole sway in the direction of propagation. In addition, the elevation angle of the reflector can be set by moving the belt from the ground.

3,605,106

SLOT FITTING OF CODED LINEAR ARRAY ANTENNA

Frank S. Gutleber, Little Silver, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

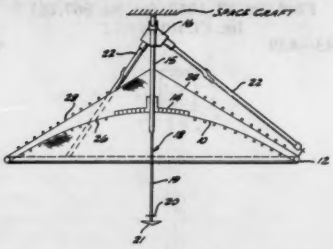
Filed June 30, 1969, Ser. No. 837,834
Int. Cl. H01q *21/00*
U.S. Cl. 343—844 **5 Claims**



There is provided a method for fitting the irregular radiator spacing as disclosed in U.S. Pat. No. 3,130,410 into a

regular grid by approximation. This permits the construction of a space-coded array in a simpler and less costly manner.

3,605,107
LIGHTWEIGHT REFLECTING STRUCTURES UTILIZING MAGNETIC DEPLOYMENT FORCES
Kurt Amboss, and Wolfgang Knauer, both of Malibu, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed July 17, 1969, Ser. No. 842,525
Int. Cl. H01q *15/20, 19/12, 1/36*
U.S. Cl. 343—915 **5 Claims**

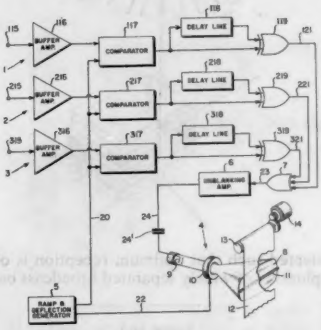


The apparatus of the present invention provides an ultralightweight collapsible reflecting structure for electromagnetic wave energy that is primarily intended for space applications. The vast distances over which space systems must operate frequently dictate the use of antennas which are highly directional, which generally requires large reflecting structures of relatively close dimensional tolerances for focusing the electromagnetic radiation. The collapsible reflectors of the present case are provided by a precontoured flexible lightweight foil or screen which is deployed by the use of magnetic pressures generated by current loops or permanent magnets.

3,605,108
PLATFORM STABILIZER FOR POLE-MOUNTED ANTENNA
Arthur B. Crawford, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 17, 1969, Ser. No. 867,150
Int. Cl. H01q *3/02*
U.S. Cl. 343—882 **2 Claims**

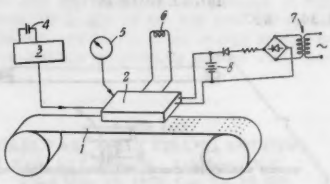
A pole-mounted directional microwave antenna secured to a platform is disclosed. The platform is rotatably mounted atop the pole so that the elevation angle of the beam axis of the antenna may be controlled. A stabilizing outrigger rod is mounted parallel to the pole, and the rod is linked to the platform. Spacers between the pole and the rod maintain a fixed separation, and when the pole is deflected in a plane containing the beam axis the rod is deflected in a parallel manner causing the platform to rotate so that the beam axis remains parallel to its undeflected orientation, thus automatically compensating for wind-induced pole sway in the direction of propagation. Three rods are used to compensate for sway in any direction.

3,605,109
METHOD AND APPARATUS FOR PRODUCING CONTINUOUS GRAPHIC DISPLAYS FROM INTERMITTENTLY SAMPLED DATA
Tommy N. Tyler, Englewood, and Peter R. Lowe, Denver, both of, Colo., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Jan. 8, 1970, Ser. No. 1,427
Int. Cl. G01d *9/32*
U.S. Cl. 346—1 **20 Claims**



The values of a plurality of data signals to be plotted against time as curves on a moving photosensitive record sheet are sampled by being simultaneously compared continuously with a single cyclically repeated ramp voltage by a plurality of comparators. Each of the latter produces an output each time that the ramp voltage just exceeds the value of the corresponding signal. The ramp voltage is synchronized with the horizontal sweep for a fiber optics cathode-ray tube, across the optics strip of which the record sheet is advanced at right angles. An EXCLUSIVE OR gate for each signal unblanks the normally blanked beam of the tube for a period in each sweep to mark a line on the sheet. Each period is that in which the ramp voltage lies between the two values of the corresponding signal at which the corresponding comparator output is produced for the present and the immediately previous sweeps. The lines produced for each signal combine to form a recorded curve for that signal. In one form, each gate is controlled by the corresponding comparator output applied both directly and through a device providing a delay of one sweep period. In another form, each gate is controlled by two comparator outputs, one based on the present value of the corresponding signal, and the other based on a stored value of that signal from the previous sweep.

3,605,110
EVENTS RECORDERS
David Conner Southward, London, and Peter Eric Smith, Caversham, both of, England, assignors to Audits of Great Britain Limited, London, England
Filed Dec. 23, 1968, Ser. No. 785,951
Claims priority, application Great Britain, Jan. 4, 1968, 710/68
Int. Cl. H04n *7/02*
U.S. Cl. 346—37 **14 Claims**



An events recorder comprising a clock provided by an intermittently energized stepping motor which is held in its sta-

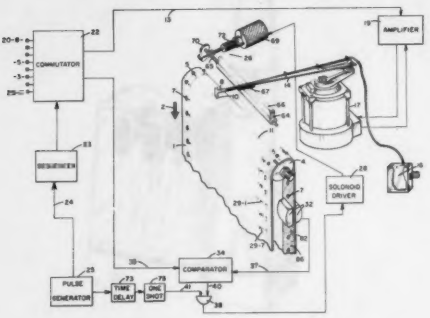
tionary positions by its remanent magnetism, and, for television receiver monitoring, a pickup coil for picking up receiver line frequency to sense the beginning and end of viewing.

3,605,111

TRACE-INTERRUPTING MULTICHANNEL RECORDER

Ronald H. Schmoll, Broadview Heights, Ohio, assignor to Clevite Corporation

Filed Mar. 19, 1970, Ser. No. 21,041
Int. Cl. G01d 9/34
U.S. Cl. 346—62 6 Claims



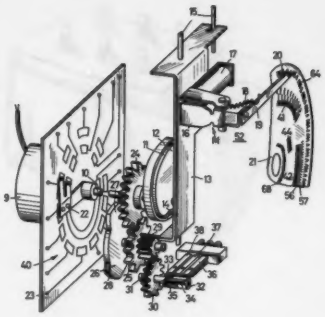
A multichannel strip chart recorder has a commutator to sequentially sample signals at a plurality of channels and apply the samples to a single-pen recording device. A spring-biased actuator holds the pen off the chart during commutation. A solenoid overcomes the spring allowing the pen to record a dot for each signal sample. Thus, each signal is recorded as a trace made up of a series of dots. Trace-identifying symbols are preprinted sequentially and repetitively along an edge of the chart in predetermined relation to the chart sprocket holes. As each symbol moves into approximate alignment with the path of the recording pen tip the solenoid action is inhibited by signals from electro-optical devices sensing the positions of sprocket holes and notches at the edge of the chart so that the trace identified with that symbol is interrupted. When the signal at one channel has higher frequency content than the signals at other channels, the commutator sequence may be arranged to sample that signal more often than the signals at other channels.

3,605,112

APPARATUS FOR RECORDING THE NUMBER OF EVENTS AT A MACHINE

Oskar Zumkeller, Villingen, and Karl-Christian Christiansen, Moenchweiler, both of, Germany, assignors to Kienzle Apparate G.m.b.H., Villingen, Black Forest, Germany

Filed Apr. 24, 1970, Ser. No. 31,656
Claims priority, application Germany, Apr. 26, 1969, P 19 21 339.9
Int. Cl. G07c 3/12
U.S. Cl. 346—67 10 Claims



Two series of radial lines are recorded in adjacent circular tracks of a rotating record carrier for representing workpieces produced by a machine. Since the recorded lines are spaced in each track twice as far as if only one track were provided, automatic evaluation of the recorded number of lines is facilitated. The apparatus has a multivibrator and two AND gates for routing alternate pulses representing workpieces to different contact means of a rotary switch by which the positions of the recording means on different tracks are determined.

tionary pulsions by the rotating magnetism, and for balancing non-rotational vibrations by pulsing one or another of two vibrating masses to oppose the vibrations and cause the receiver to vibrate in a single plane.

2,605,311

TRACE-INTERFERENCE ELECTRIC HARNESS

Ronald B. Schmidt, Bryan, and Theodore Ohlin, Antigone to Ohio, assignors to The Cornelius Corporation

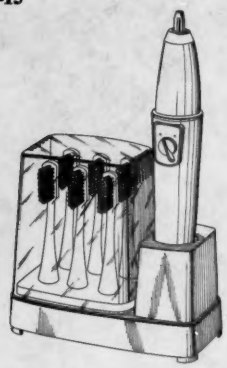
Filed June 10, 1950, Ser. No. 167,841

10 Claims. (Cl. 200—51)

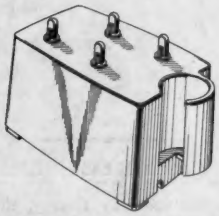
DESIGNS

SEPTEMBER 14, 1971

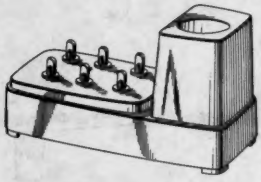
221,823
AUTOMATIC TOOTHBRUSH
William J. Cook, Trumbull, Conn., assignor to General Electric Company
Filed Aug. 11, 1970, Ser. No. 24,426
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—15



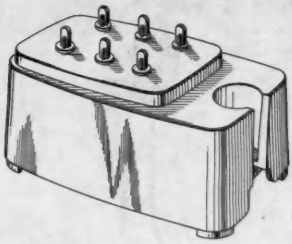
221,824
HOLDER FOR AN ELECTRIC TOOTHBRUSH OR SIMILAR DEVICE
William J. Cook, Trumbull, Conn., assignor to General Electric Company
Filed June 24, 1970, Ser. No. 23,639
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—16



221,825
HOLDER FOR AN ELECTRIC TOOTHBRUSH
William J. Cook, Trumbull, Conn., assignor to General Electric Company
Filed July 6, 1970, Ser. No. 23,825
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—16



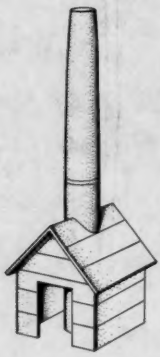
221,826
HOLDER FOR AN ELECTRIC TOOTHBRUSH
William J. Cook, Trumbull, Conn., assignor to General Electric Company
Filed Sept. 23, 1970, Ser. No. 25,168
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—16



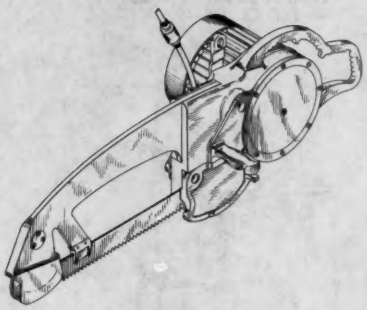
221,827
FOUNTAIN TOOTHBRUSH WITH POCKET HOLDER
Benjamin N. Yamada, Menlo Park, Calif., assignor to William A. Anderson, San Francisco, and Raymond H. Heiskell, San Mateo, Calif.
Filed Sept. 21, 1970, Ser. No. 25,101
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25

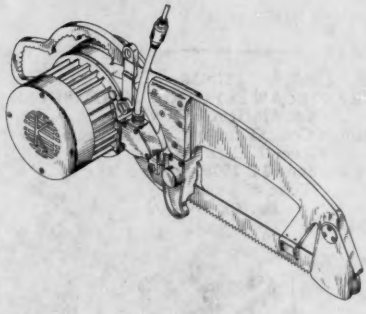
221,828
COMBINED FOUNTAIN TOOTHBRUSH AND HOLDER
Benjamin N. Yamada, Menlo Park, Calif., assignor to William A. Anderson, San Francisco, and Raymond H. Heiskell, San Mateo, Calif.
Filed Sept. 21, 1970, Ser. No. 25,118
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25

221,829
COMBINED CHILD'S FOUNTAIN TOOTHBRUSH AND HOLDER
Benjamin N. Yamada, Menlo Park, Calif., assignor to William A. Anderson, San Francisco, and Raymond H. Heiskell, San Mateo, Calif.
Filed Sept. 21, 1970, Ser. No. 25,105
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—26



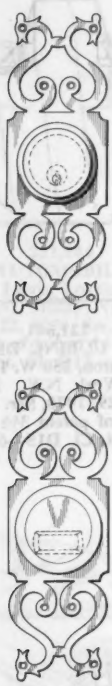
221,830
CARCASS SPLITTER
Ralph Karubian, 2001 W. Gage Ave., Los Angeles, Calif. 90047
Filed Aug. 17, 1970, Ser. No. 24,525
Term of patent 14 years
Int. Cl. D8—*02*; D7—*99*
U.S. Cl. D8—54



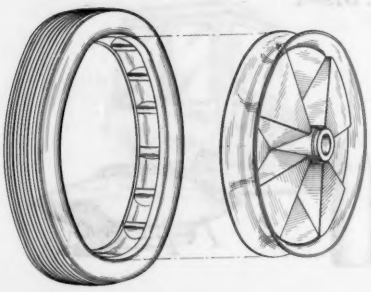


221,831
PULL
Howard B. Gorton and Ray Tintary, Covina, Calif., assignors to Ajax Hardware Manufacturing Corp., City of Industry, Calif.
Filed Aug. 12, 1970, Ser. No. 24,446
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—166

221,832
DECORATIVE ESCUTCHEON FOR BARREL LOCKS, LATCHES OR THE LIKE
Hubert Vachette, Paris, France, assignor to Securite et Decoration, Paris, France
Filed Jan. 26, 1970, Ser. No. 21,088
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—179



221,833
CASTER WHEEL
Raymond S. Haydock, deceased, late of Chicago, Ill., by Mildred Rose Haydock, executrix, Chicago, Ill. (8020 N. Austin Ave., Morton Grove, Ill. 60053)
Filed Mar. 18, 1969, Ser. No. 16,316
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—226

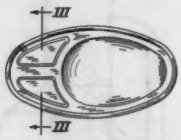


221,834
BOTTLE
Ira W. Schwartz, Great Neck, N.Y., assignor to National Distillers and Chemical Corporation, New York, N.Y.
Filed June 10, 1970, Ser. No. 23,411
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—48

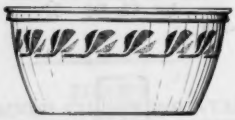
221,835
COMBINED BOTTLE AND CLOSURE THEREFOR
Cyril Edward Higgs, Leeds, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Apr. 13, 1970, Ser. No. 22,398
Claims priority, application Great Britain Oct. 15, 1969
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—149

221,836
BOTTLE
Robert L. Giles, Mundelein Village, and Clarence J. Endlcott, Waukegan, Ill., assignors to Abbott Laboratories, Chicago, Ill.
Filed July 16, 1970, Ser. No. 23,985
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—160

221,837
SPOON-SHAPED PACKAGING ELEMENT FOR FOOD OR THE LIKE
William E. R. Watt, New Kensington, and Regis A. Fleck, Tarentum, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Oct. 25, 1968, Ser. No. 14,184
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—185

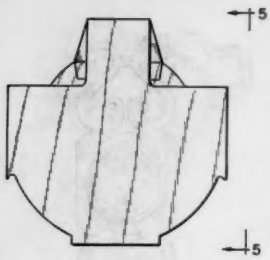


221,838
PACKAGING CUP
Robert A. Fraser, Baltimore, Md., assignor to J. H. Filbert, Inc., Baltimore, Md.
Filed May 28, 1970, Ser. No. 23,199
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—220

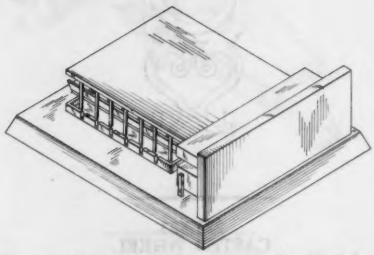


221,839
DISPLAY CONTAINER
Donald A. Leathers, 1 School St., South Easton, Mass. 02375
Filed July 13, 1970, Ser. No. 23,912
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—222

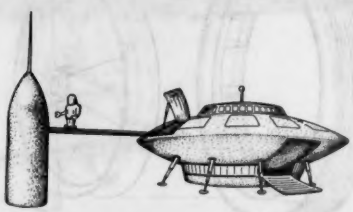
221,840
PACKAGE FOR CULINARY WARE
David J. Freiman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed July 20, 1970, Ser. No. 24,018
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—250



221,841
MEAT CUBING DEVICE
Irene Saxton, 250 W. 100th St., New York, N.Y. 10025
Filed June 29, 1970, Ser. No. 23,742
Term of patent 3½ years
Int. Cl. D15—*08*
U.S. Cl. D11—1

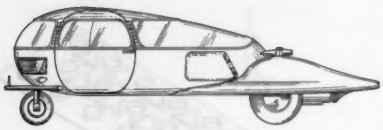


221,842
BUILDING
Lee Sebastian, 6372 Orange St., Los Angeles, Calif. 90048
Filed Nov. 28, 1969, Ser. No. 20,308
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

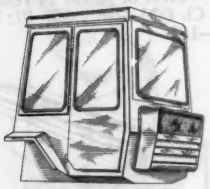


221,843
BUILDING UNIT
William C. Mead, 87 Day St., Granby, Conn. 06035
Continuation-in-part of design application Ser. No. 14,261, Nov. 1, 1968. This application June 8, 1970, Ser. No. 23,379
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1

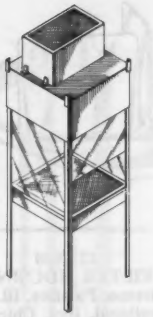
221,844
AUTOMOBILE
Paul M. Lewis, Loveland, Colo.
(P.O. Box 651, Sidney, Nebr. 69162)
Filed July 22, 1970, Ser. No. 24,063
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3



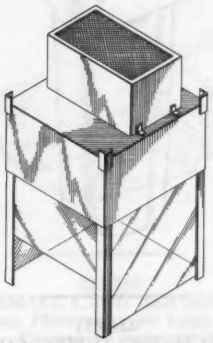
221,845
TRACTOR CAB
Leo J. Lorenz, Farmington, and Wilford E. Bean, Southfield, Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.
Filed Aug. 21, 1970, Ser. No. 24,620
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—27



221,846
ENVIRONMENTAL WORK STATION
Warren E. Dexter, Fairfax, Va.
(P.O. Box 395, Annandale, Va. 22003)
Filed Apr. 1, 1970, Ser. No. 22,168
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D16—2

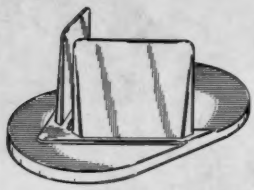


221,847
ENVIRONMENTAL WORK STATION
Warren E. Dexter, Fairfax, Va.
(P.O. Box 395, Annandale, Va. 22003)
Filed Apr. 1, 1970, Ser. No. 22,169
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D16—2

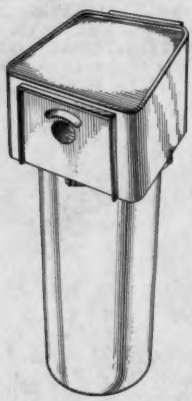


221,848
FISHING LURE BODY
James W. Omdall, Jr., Box 93, Palmyra, Wis. 53156
Filed Aug 4, 1970, Ser No 24,291
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

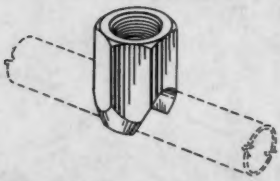
221,849
FISHING FLOAT
Leo J. Spade, Nashville, Kans. 67112
Filed May 20, 1970, Ser. No. 23,068
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—30



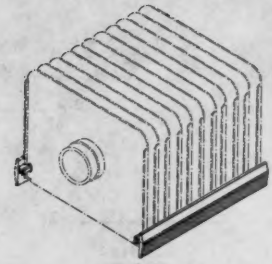
221,850
FILTER HOUSING
Douglas West Anderson, Palatine, Ill., assignor to Morton International, Inc., Chicago, Ill.
Filed Mar. 2, 1970, Ser. No. 21,698
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



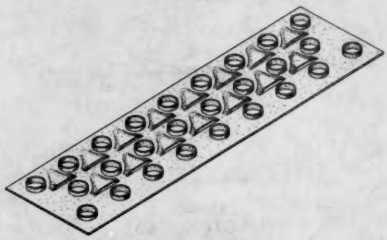
221,851
VALVE RECEIVING TUBING CONNECTOR
John W. Mullins, P.O. Box 20524, Oklahoma City, Okla. 73120
Filed Mar. 2, 1970, Ser. No. 21,708
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40



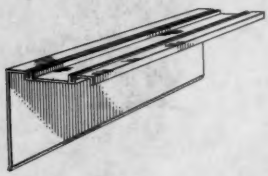
221,852
CORNER RAIL FOR FIN-AND-TUBE BASEBOARD HEATING ELEMENTS
Claude William Schaefer, Jr., 119 St. Dunstans Road, Baltimore, Md. 21212
Filed May 4, 1970, Ser. No. 22,800
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



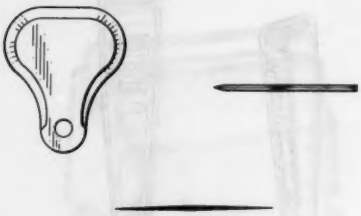
221,853
HEAT RADIATION PLATE
Keiichi Kimura, 2–304 Osakabe, Yaoshi, Osakafu, Japan
Filed Dec. 31, 1969, Ser. No. 20,722
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



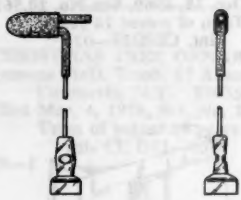
221,854
CURBING FOR ROOF VENTILATOR OPENING
Joshua R. Dowdell, Jr., Dallas, and Paul H. Sanderson, Jr., Lake Dallas, Tex., assignors to Dowco Corporation, Dallas, Tex.
Filed June 17, 1970, Ser. No. 23,540
Term of patent 14 years
Int. Cl. D23—*04;* D25—*01;* D8—*03*
U.S. Cl. D23—153



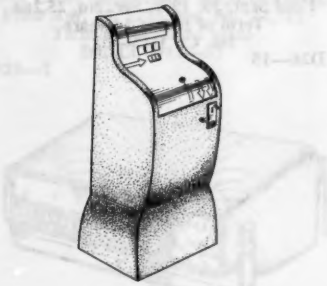
221,855
BLADE FOR A DENTAL INSTRUMENT
James Vannes Boone, Meadows Bldg., Dallas, Tex. 75206
Filed Oct. 13, 1969, Ser. No. 19,514
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1



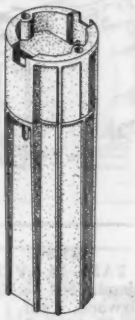
221,856
TEST LEAD
Newil J. Kinnard, Kettering, Ohio, assignor to The National Cash Register Company, Dayton, Ohio
Filed Jan. 8, 1970, Ser. No. 20,806
Term of patent 14 years
Int. Cl. D10—*11*
U.S. Cl. D26—1



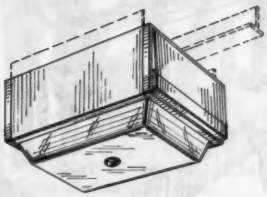
221,857
BREATH TESTING MACHINE CABINET
Herbert C. Schulze, Carlsbad, Calif. 92008; Sam Priestly, Carlsbad, Calif. (P.O. Box 1069, Oceanside, Calif. 92054); and Marthe-Ann Klimo, P.O. Box 105, Encinitas, Calif. 92024
Filed May 13, 1970, Ser. No. 22,950
Term of patent 3½ years
Int. Cl. D21—*04*
U.S. Cl. D26—1



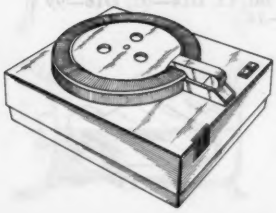
221,858
SUBMERSIBLE MOTOR COMPONENTS HOUSING
Elmer M. Deters, Muscatine, Iowa, assignor to Red Jacket Manufacturing Company, Davenport, Iowa
Filed May 18, 1970, Ser. No. 23,029
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D26—1E



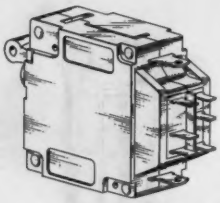
221,859
HOUSING FOR GARAGE DOOR OPERATOR
Giacinto C. Dercoli, Park Forest, Ill., assignor to The Alliance Manufacturing Company, Inc.
Filed Jan. 26, 1970, Ser. No. 21,066
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D26—5



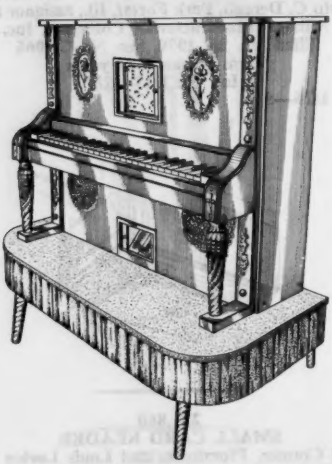
221,860
SMALL CARD READER
Bernhard Cramer, Pforzheim, and Louis Lucien Lepoix, Baden-Baden, Germany, assignors to International Standard Electric Corporation, New York, N.Y.
Filed May 4, 1970, Ser. No. 22,787
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



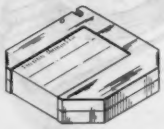
221,861
CIRCUIT BREAKER
Ralph B. Davis, Lawrence Township, Mercer County, N.J. (8 Devon Ave., Trenton, N.J. 98638)
Filed Apr. 27, 1970, Ser. No. 22,657
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



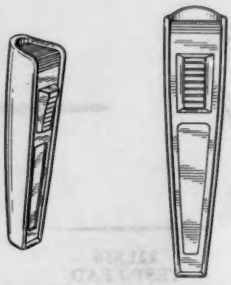
221,862
TAPE PLAYER
LeRoy Benjamin, 501 N. Highland Ave., Hollywood, Calif. 90036
Filed Aug. 18, 1969, Ser. No. 18,732
Term of patent 14 years
Int. Cl. D14—*01*; D17—*01*
U.S. Cl. D26—14



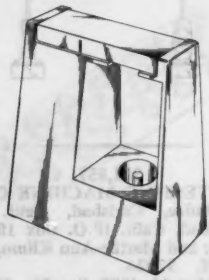
221,863
TAPE CASSETTE OR SIMILAR ARTICLE
Lewis W. Bennett, Rochester, N.Y., assignor to The Singer Company
Filed Apr. 13, 1970, Ser. No. 22,377
Term of patent 14 years
Int. Cl. D14—*02*; D16—*99*
U.S. Cl. D26—14



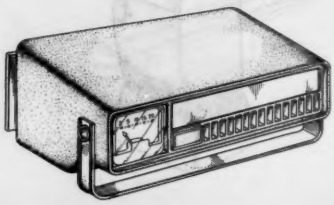
221,864
MICROPHONE
Robert E. Haueter, Minneapolis, Minn., assignor to The Telex Corporation, Tulsa, Okla.
Filed July 24, 1970, Ser. No. 24,105
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



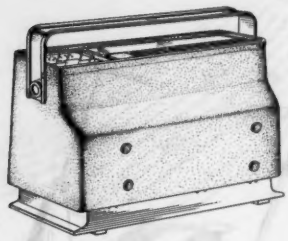
221,865
COMBINED HOLDER AND RECHARGER FOR ELECTRIC SHAVERS
Norman D. Poisson, 21 Nicholson St., Marblehead, Mass. 01945
Filed Dec. 18, 1969, Ser. No. 20,562
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—15



221,866
BATTERY CHARGER
Lawrence W. Bonzer, Long Beach, Calif., assignor to Lear-Siegler, Incorporated, Santa Monica, Calif.
Filed Sept. 30, 1970, Ser. No. 25,264
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—15



221,866
BATTERY CHARGER
Lawrence W. Bonzer, Long Beach, Calif., assignor to Lear-Siegler, Incorporated, Santa Monica, Calif.
Filed Sept. 30, 1970, Ser. No. 25,264
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—15

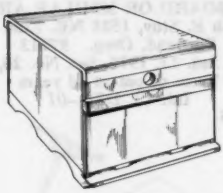


221,867
CHRISTMAS TREE ORNAMENT
Ramona McD. Trush, 67 Albany St., Cazenovia, N.Y. 13035
Filed Mar. 4, 1970, Ser. No. 21,734
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D29—1

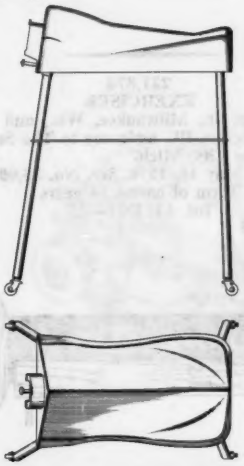
221,868
FIBER OPTIC CHRISTMAS TREE ORNAMENT
Shirlee E. Fairchild and Virginia M. Lawn, Huntington Beach, Calif., assignors to Poly-Optics, Inc.
Filed Apr. 30, 1970, Ser. No. 22,721
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D29—1

221,869
DECORATIVE PLAQUE OR SIMILAR ARTICLE
Joan K. Deck, W. Circle Drive, Martinsville, N.J. 08836
Filed June 15, 1970, Ser. No. 23,466
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23

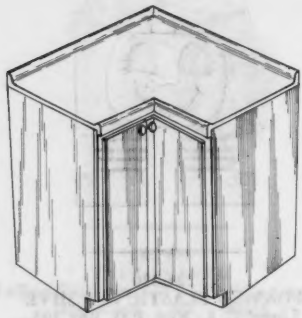
221,870
FOAMED PLASTIC BEE HIVE
Lionel C. L. Kett, P.O. Box 105, Pleasanton, Calif. 94566
Filed Nov. 5, 1969, Ser. No. 19,948
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



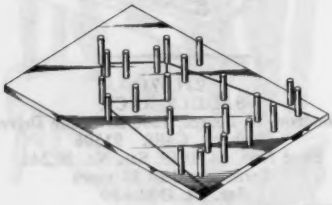
221,871
SADDLE RACK
Woodrow W. Pearce, 1200 Riverside Drive, Burbank, Calif. 91506
Filed Nov. 24, 1969, Ser. No. 20,241
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—45



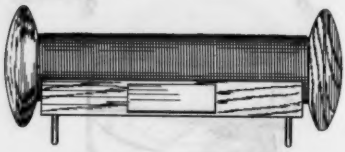
221,872
CABINET
Valentino Lancione, 908 Hazel Way, Coraopolis, Pa. 15108
Filed Sept. 30, 1969, Ser. No. 19,354
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—19



221,873
GAME BOARD OR SIMILAR ARTICLE
Joseph E. Stoy, 1525 NE. 72nd St., Portland, Oreg. 97213
Filed Jan. 12, 1970, Ser. No. 20,890
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

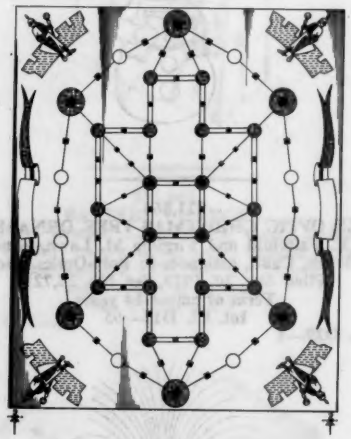


221,874
EXERCISER
Harry J. Collins, Jr., Milwaukee, Wis., and William F. Deknatel, Chicago, Ill., assignors to The Setwell Company, Traverse City, Mich.
Filed May 15, 1970, Ser. No. 23,003
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

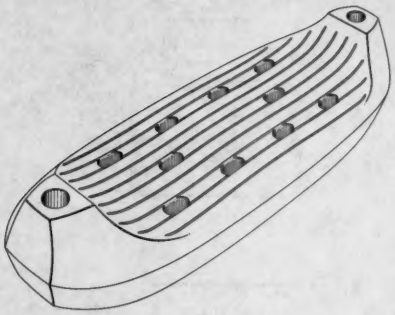


221,875
STATIONARY EXERCISE BICYCLE
David H. Braun, Miami, Fla., assignor to Allied Leisure Industries, Inc., Hialeah, Fla.
Filed May 28, 1970, Ser. No. 23,196
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

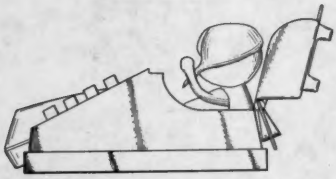
221,876
GAME BOARD
William S. Kelly, 67—81 Alderton St., Rego Park, N.Y. 11374
Filed May 28, 1970, Ser. No. 23,202
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



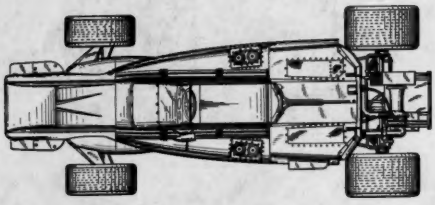
221,877
SWING SEAT
James E. Richardson, Weston, Conn., assignor to Cambridge Research and Development Group, Westport, Conn.
Filed July 17, 1970, Ser. No. 24,003
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5



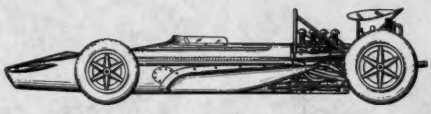
221,878
TOY TELEPHONE
Ernest L. Thornell, Horicon, Wis., assignor to The Quaker Oats Company
Continuation of design application Ser. No. 16,106, Mar. 7, 1969. This application June 4, 1970, Ser. No. 23,320
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



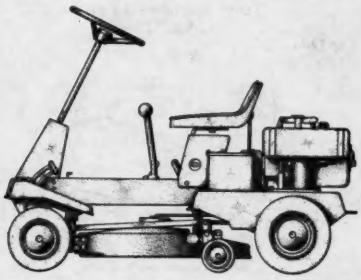
221,879
MODEL RACING CAR
Daniel S. Gurney, Santa Ana, Calif., assignor to All American Racers, Inc., Santa Ana, Calif.
Filed Sept. 10, 1970, Ser. No. 24,941
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

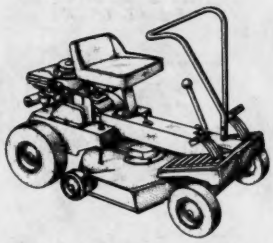


221,880
MODEL RACING CAR
Robert John Herd, Milton Malsor, England, assignor to March Engineering Limited, Oxfordshire, England
Filed July 31, 1970, Ser. No. 24,246
Claims priority, application Great Britain Feb. 2, 1970
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



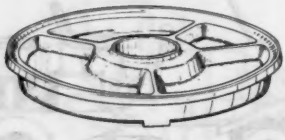
221,881
RIDING MOWER
Robert B. Mead, Wilmington, Ohio, assignor to Mast-Foos Manufacturing Company, Inc., Springfield, Ohio
Filed Apr. 2, 1970, Ser. No. 22,199
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1



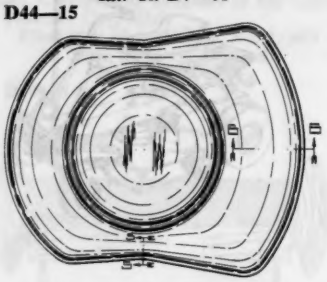


221,882
CLOCK OR SIMILAR ARTICLE
Arthur M. Felske, Westport, Conn., assignor to General Electric Company
Filed June 29, 1970, Ser. No. 23,707
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7

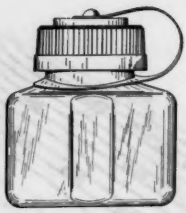
221,883
BUFFET TRAY
John Brian Cash, Hotel Picadilly, Manchester 1, England
Filed Apr. 2, 1970, Ser. No. 22,214
Claims priority, application Great Britain Nov. 21, 1969
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—10



221,884
COMBINED BOWL AND PLATE
Charles L. Seltz, Ann Arbor, Mich., assignor to King-Seeley Thermos Company, Ann Arbor, Mich.
Filed July 6, 1970, Ser. No. 23,838
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15

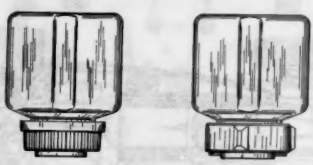


221,885
LUBRICATOR RESERVOIR OR SIMILAR ARTICLE
Donald G. Gruett, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.
Filed Apr. 15, 1970, Ser. No. 22,444
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D46—1

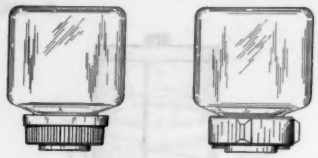


221,886
LUBRICATOR RESERVOIR OR SIMILAR ARTICLE
Donald G. Gruett, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.
Filed Apr. 15, 1970, Ser. No. 22,445
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D46—1

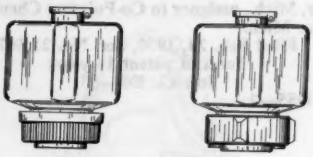
221,887
LUBRICATOR RESERVOIR OR SIMILAR ARTICLE
Donald G. Gruett, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.
Filed Apr. 15, 1970, Ser. No. 22,446
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D46—1



221,888
LUBRICATOR RESERVOIR OR SIMILAR ARTICLE
Donald G. Gruett, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.
Filed Apr. 15, 1970, Ser. No. 22,447
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D46—1

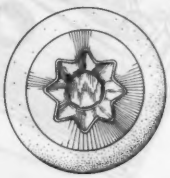


221,889
LUBRICATOR RESERVOIR OR SIMILAR ARTICLE
Donald G. Gruett, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.
Filed Apr. 15, 1970, Ser. No. 22,448
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D46—1

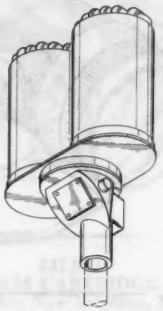


221,890
LUBRICATOR RESERVOIR OR SIMILAR ARTICLE
Donald G. Gruett, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.
Filed Apr. 15, 1970, Ser. No. 22,449
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D46—1

221,891
CANDLE HOLDER
David Douglas, 1119 Lincoln Blvd., Manitowoc, Wis. 54220
Filed Sept. 29, 1970, Ser. No. 25,260
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



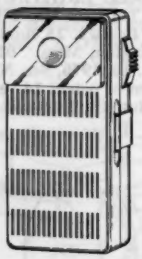
221,892
COMBINED BALLAST SUPPORT AND BRACKET FOR A LIGHT FIXTURE
Carl R. Snyder, Alief, Tex., assignor to Esquire, Inc., New York, N.Y.
Filed Mar. 30, 1970, Ser. No. 22,099
Term of patent 14 years
Int. Cl. D26—*99, 03*
U.S. Cl. D48—4



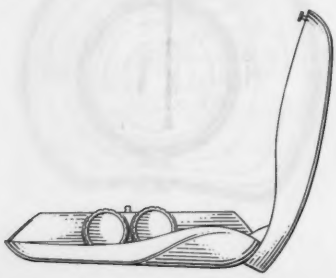
221,893
BATTERY POWERED LIGHTING FIXTURE FOR WALL, CEILING OR THE LIKE
Curtiss M. Peasley, 25 Boulder Drive, Burlington, Mass. 01803
Filed Sept. 10, 1970, Ser. No. 24,933
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—4

221,894
COMBINED ELECTRIC LANTERN AND MOVEABLE HANDLE THEREFOR
Nolan K. Rhoades, Beloit, Wis., assignor to ESB Incorporated
Filed Feb. 27, 1970, Ser. No. 21,660
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24

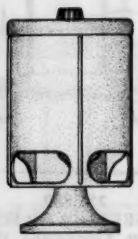
221,895
CASING FOR AN ELECTRIC LAMP
Rene Marcel Angibaud, Vernon, France, assignor to Société les Piles Wonder
Filed July 16, 1970, Ser. No. 23,981
Claims priority, application France Feb. 18, 1970
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24



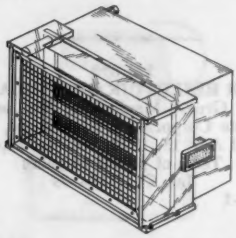
221,896
FERTILITY TIMING CALCULATOR
James E. Richardson, Weston, Conn., assignor to Cambridge Research and Development Group, Westport, Conn.
Filed Nov. 21, 1969, Ser. No. 20,209
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D52—1



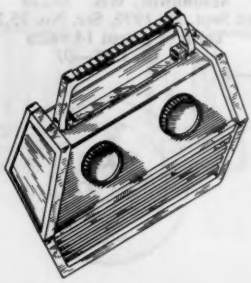
221,897
BOTTLE DISPENSER
Louis Brodsky, Parlin, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.
Filed May 7, 1970, Ser. No. 22,880
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—2



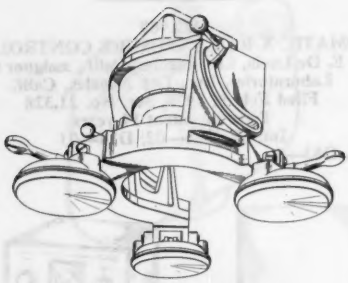
221,898
ELECTROSTATIC FIBER APPLICATOR
Vernon J. Pewtress, Farmington Township, Oakland County, Mich., assignor to Co-Polymer Chemicals, Inc., Livonia, Mich.
Filed Feb. 24, 1970, Ser. No. 21,567
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D55—1



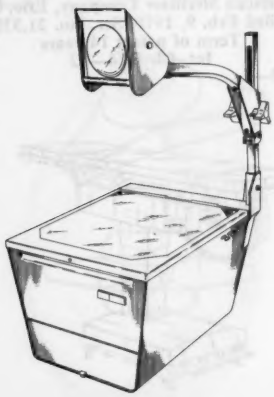
221,899
PORTABLE RADIO
E. Burton Benjamin, Chicago, Ill., assignor to Midland International Corporation, North Kansas City, Mo.
Filed May 25, 1970, Ser. No. 23,140
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4



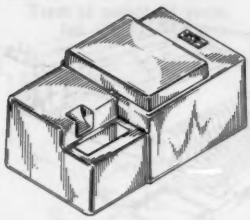
221,900
SUPPORT FOR A CINEMATOGRAPH, TELEVISION, STILL CAMERA OR OTHER OPTICAL INSTRUMENT
David Wylie Samuelson, Ronald Valentine Prime, and Brian Frederick Elsden, London, England, assignors to Samuelson Film Service Limited, London, England
Filed Dec. 23, 1969, Ser. No. 20,612
Term of patent 14 years
Int. Cl. D16—*07*
U.S. Cl. D61—1



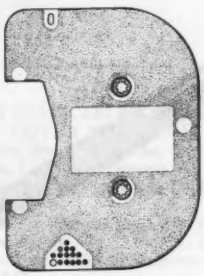
221,901
OVERHEAD PROJECTOR
Jacob W. Patla, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Mar. 5, 1970, Ser. No. 21,748
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1



221,902
SCROLL STRIPPER FOR MICROFILM CARTRIDGE
Nicholas P. Schleich, Golf, Ill., assignor to The Matrix Corporation
Filed Mar. 9, 1970, Ser. No. 21,814
Term of patent 7 years
Int. Cl. D16—*06*
U.S. Cl. D61—1

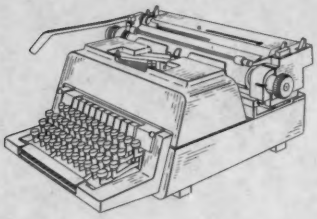


221,903
FILM CARTRIDGE
Richard Alan De Vries, New Brighton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Aug. 17, 1970, Ser. No. 24,541
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D61—1



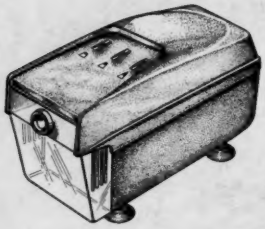
221,904
TYPEWRITER
Ettore Sottsass, Jr., Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Torino, Italy
Filed Oct. 2, 1970, Ser. No. 25,307
Claims priority, application Italy Apr. 20, 1970
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

221,905
TYPEWRITER
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Torino, Italy
Filed Nov. 9, 1970, Ser. No. 25,898
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

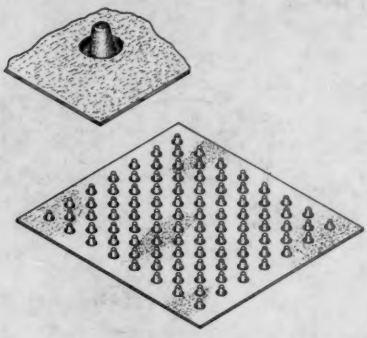


221,906
WRITING IMPLEMENT
Joseph J. Collins, Los Angeles, Calif. (15050 Burbank Blvd., Van Nuys, Calif. 91401), and Pasqual F. Fortugno, Los Angeles, Calif.; said Fortugno assignor to said Collins
Filed Apr. 16, 1970, Ser. No. 22,466
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17

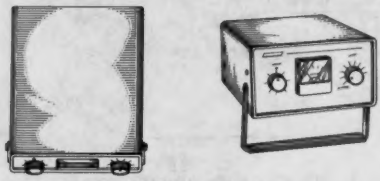
221,907
ELECTRIC PENCIL SHARPENER
Daisuke Kajiwara, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sept. 14, 1970, Ser. No. 24,962
Claims priority, application Japan Mar. 20, 1970
Term of patent 14 years
Int. Cl. D19—*099*
U.S. Cl. D74—21



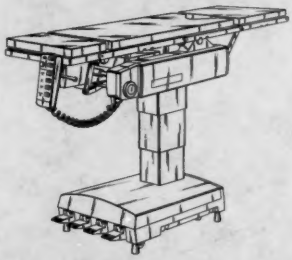
221,908
SURGICAL INSTRUMENT HOLDER
Howard Berkowitz, Stony Brook, N.Y., assignor to Surgi-Med Corporation, Great Neck, N.Y.
Filed Jan. 12, 1970, Ser. No. 20,875
Term of patent 14 years
Int. Cl. D24—*99*; D5—*03*
U.S. Cl. D83—1



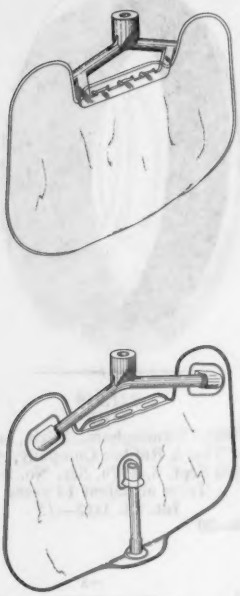
221,909
AUTOMATIC X-RAY EXPOSURE CONTROL UNIT
Victor E. De Lucia, Los Angeles, Calif., assignor to Torr Laboratories, Inc., Los Angeles, Calif.
Filed Feb. 9, 1970, Ser. No. 21,328
Term of patent 14 years
Int. Cl. D24—*02*; D14—*03*
U.S. Cl. D83—1



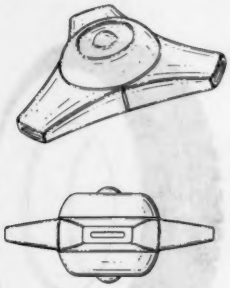
221,910
SURGICAL TABLE
Thomas Brendgord, Fairview, Pa., assignor to American Sterilizer Company, Erie, Pa.
Filed Feb. 9, 1970, Ser. No. 21,339
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1



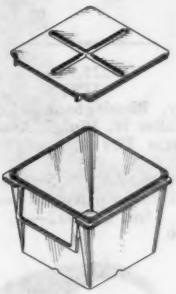
221,911
MEDICAL DRAINAGE BAG OR SIMILAR ARTICLE
Richard E. Ericson, Keene, N.H., assignor to Elliot Laboratories, Inc., Fitzwilliam, N.H.
Filed Mar. 19, 1970, Ser. No. 21,971
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D83—1



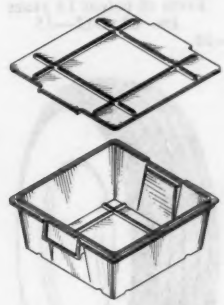
221,912
CHILD'S MUSICAL TEETHING TOY
David Day, Hill Cottage, Pippingford, Nutley, Sussex, England
Filed Aug. 6, 1970, Ser. No. 24,338
Term of patent 7 years
Int. Cl. D24—*05*
U.S. Cl. D83—8



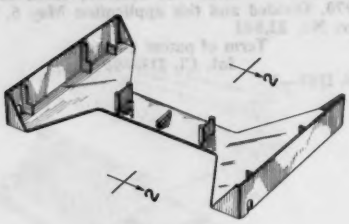
221,913
COMBINED STACKABLE CONTAINER AND COVER THEREFOR
George D. Perkins, South Pasadena, and David E. Workman, Pasadena, Calif., and Joseph W. Kneier, Chesterland, Ohio, assignors to Pendleton Tool Industries, Inc., Los Angeles, Calif.
Original design appplication Dec. 16, 1968, Ser. No. 14,977, now Patent No. 218,658, dated Sept. 8, 1970. Divided and this application May 6, 1970, Ser. No. 22,841
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



221,914
COMBINED STACKABLE CONTAINER AND COVER THEREFOR
George D. Perkins, South Pasadena, and David E. Workman, Pasadena, Calif., and Joseph W. Kneier, Chesterland, Ohio, assignors to Pendleton Tool Industries, Inc., Los Angeles, Calif.
Original design application Dec. 16, 1968, Ser. No. 14,977, now Patent No. 218,658, dated Sept. 8, 1970. Divided and this application May 6, 1970, Ser. No. 22,847
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



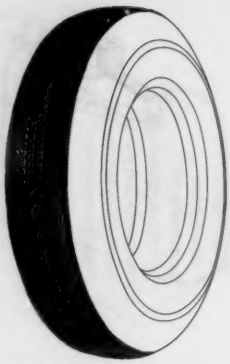
221,915
TAPE CASSETTE TRAY
Robert L. Goldthwaite, New Milford, Conn., and Donald D. Merry, Plymouth, Mich., assignors to Richardson-Merrell Inc., New York, N.Y.
Filed Aug. 12, 1970, Ser. No. 24,444
Term of patent 14 years
Int. Cl. D3—*99;* D14—*02*
U.S. Cl. D87—1



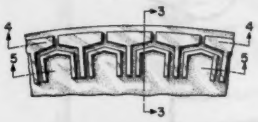
221,916
TIRE
Harold D. Fetty, Birmingham, Mich., and James J. Martell and Walter W. Hinkel, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Aug. 17, 1970, Ser. No. 24,513
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20

221,917
TIRE
Harold D. Fetty, Birmingham, Mich., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sept. 2, 1970, Ser. No. 24,804
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20

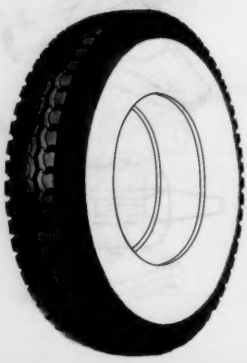
221,918
TIRE
Harold D. Fetty, Birmingham, Mich., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sept. 8, 1970, Ser. No. 24,884
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



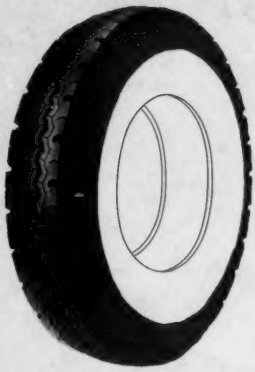
221,919
TIRE
Harold D. Fetty, Birmingham, Mich., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sept. 8, 1970, Ser. No. 24,885
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



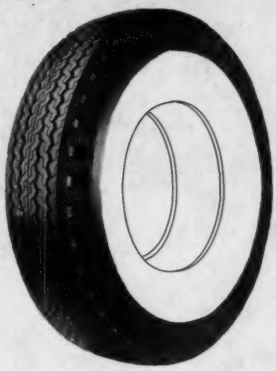
221,920
TIRE
Harold D. Fetty, Birmingham, Mich., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sept. 10, 1970, Ser. No. 24,916
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



221,921
TIRE
Harold D. Fetty, Birmingham, Mich., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sept. 10, 1970, Ser. No. 24,917
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



221,922
TIRE
Harold D. Fetty, Birmingham, Mich., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sept. 10, 1970, Ser. No. 24,918
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF SEPTEMBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Gray, Robert F., 3,604,175.
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Abbiati, Ettore, to Olivetti, Ing., C., & C., S.p.A. Biquinary calculating machine. 3,604,619, Cl. 235-61.
Abbott, Frank R., to United States of Ameria, Navy. Electrodynamic sonar projector. 3,605,080, Cl. 340-12.
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ABU Aktiebolag: *See—*
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Achberger, Melvin B., to Goodrich, B. F., Company, The. Pneumatic de-icer. 3,604,666, Cl. 244-134.
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Adams, Charles B.: *See—*
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Adcox, L. D. Master container filling machine. 3,604,181, Cl. 53-61.
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Addressograph-Multigraph Corporation: *See—*
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Aerial Transit Systems, Inc.: *See—*
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Aldridge, Hal F., 3,604,039.
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Fain, Bobby R., 3,604,644.
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Dobbs, Marvin C., 3,604,481.
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Allebach, Gene E.; and Edmondson, Richard, to National Machinery Company, The. Transfer and ejection mechanism for forging machine. 3,604,242, Cl. 72-421.
Allegheny Ludlum Steel Corporation: *See—*
Dupuis, Hubert, 3,604,122.
Allen, Philips J., to United States of America, Navy. Method and apparatus for displaying visual images of infrared beams. 3,604,930, Cl. 250-83.
Allen-Bradley Company: *See—*
Walters, Robert E.; and Boysen, Gerd C., 3,604,875.
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Allers, Erling: *See—*
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Allied Chemical Corporation: *See—*
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Baxa, Edward H., 3,604,125.
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Sabaski, Richard E., 3,604,637.
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Smithwick, Whitmell J., 3,604,692.
Allison, Arthur F.; and Salzbrenner, Siegfried R., to Cutler-Hammer, Inc. Frequency base knife control systems. 3,604,300, Cl. 83-76.
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Andreassen, Per Vasteras, 3,604,984.
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Nash, John J., 3,604,097.
Altmann, Heinz C.; Bushnell, Clifford B.; West, Henry L.; and Lange, Thomas O., to Eastman Kodak Company. Apparatus and methods for determining imbalance. 3,604,248, Cl. 73-66.
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Amelchenko, Alexei Semenovich. Device for assembling radio parts with axially extending wire lead-outs. 3,604,093, Cl. 29-203.
American Cyanamid Company: *See—*
Sekiguchi, Hideto; Matsumoto, Tomohide; Hoten, Masanobu; and Kawasaki, Hideo, 3,604,197.
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Amoss, John W., Jr.: *See—*
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Amsted Industries Incorporated: *See—*
Kulieke, Frederick C., 3,604,569.
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Anchor Hocking Corporation: *See—*
Fink, Roger H., 3,604,551.
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Anderson, Clayton & Co.: *See—*
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Anderson, Gordon Campbell: *See—*
Von Kaenel, John Clifford; Anderson, Gordon Campbell; and Seymore, Stephen David, Jr.,3,604,063.

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Anderson Power Products, Inc.: *See—*
Goldman, Wayne E.; and Winkler, Edward D., 3,605,050.

Anderson, Ralph F.; and Krieps, Frank J., to Keystone Consolidated Industries, Inc. File drawer assembly. 3,604,775, Cl. 312-330.

Anderson, Thomas P., to Microseal Corporation. Film record card system. 3,604,799, Cl. 355-79.

Ando, Noriyoshi; and Majima, Kazu, to Nippon Denso Kabushiki Kaisha. Anti-skid device. 3,604,762, Cl. 303-21.

Ando, Noriyoshi: *See—*
Okamoto, Atutoshi; Ando, Noriyoshi; Taniguchi, Koichi; Nakano, Yoshiaki; and Toyama, Koichi,3,604,761.

Andreassen, Per Vasteras, to Allmanna Svenska Elektriska Aktiebolaget. Electrical connection system formed of plinths with opposed pairs of holes in front and back for receiving connectors. 3,604,984, Cl. 317-99.

Angner, Ronald Joseph, to Bell Telephone Laboratories, Incorporated. Step input responsive output pulse generation circuit. 3,604,955, Cl. 307-293.

Anthony, Albert M., to Tracor, Inc. Convergence and purity adjusting device for color television picture tube. 3,605,053, Cl. 335-212.

Antonietto, Bruno; and Pagella, Elio, to Olivetti, Ing. C., & C., S.p.A. Tool change device for a machine tool. 3,604,083, Cl. 29-26.

Antretter, Richard. Electric shaver. 3,604,111, Cl. 30-34.1

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Armco Steel Corporation: *See—*
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Arries, Frances B. Apparatus for making a food product. 3,604,367, Cl. 107-69.

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Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
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Asari, Akira, to Kobe Steel Ltd. Apparatus for the production of steel pipes by extrusion. 3,604,238, Cl. 72-206.

Asher, Glen M., to Western Wood Mfg., Co. Shelf bracket structure. 3,604,669, Cl. 248-243.

Askesji, Bengt H.; and Nyhlen, Knut Inge, to Aktiebolaget SKRIVRIT. Suspension device for teaching aids and the like. 3,604,672, Cl. 248-324.

Assour, Jacques M., to RCA Corporation. Radiation sensing device comprising an array of photodiodes and switching devices in a body of semiconductor material. 3,604,987, Cl. 317-235.

Atelian, Edmond J., to Western Gear Corporation. Tire testing apparatus. 3,604,245, Cl. 73-8.

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Athanason, Michael Tom. Padlocks. 3,604,227, Cl. 70-38.

Atkins, Thomas M., to Kelsey-Hayes Company. Skid control system. 3,604,760, Cl. 303-21.

Audeh, Azmi S.; Deodhar, Anil N.; and Glattfelder, Henry G., to Ampex Corporation. Reel servo system. 3,604,992, Cl. 318-6.

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Auphan, Michel Joseph; and Perilhou, Jean, to U.S. Philips Corporation. Device for measuring the flow intensity of circulating liquid. 3,604,263, Cl. 73-204.

Automation Electric, Inc.: *See—*
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Babcock, David H., to International Business Machines Corporation. Self-aligning bearing. 3,604,765, Cl. 308-15.

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Baily, Frederick G., to General Electric Company. Shaft sealing system for nuclear turbines. 3,604,206, Cl. 60-108.

Bain, Neil A. Method and apparatus for sealing and lubricating a washing machine transmission. 3,604,029, Cl. 8-159.

Baker, James G., to Polaroid Corporation. Compact afocal magnifying lens. 3,604,786, Cl. 350-212.

Baldauf, Lajos; Radnai, Imre; Vasvari, Janos; and Wolf, Jozsef, to Orszagos Koolaj Es Gazipari Trosgt. Cartridges containing carbon-dioxide for household purposes. 3,604,586, Cl. 220-3.

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Ballentine, Earle W. Apparatus and method for thawing frozen food. 3,604,334, Cl. 99-234.

Baltatu, Vasile, to Comitetul De Stat Pentur Cultura Si Arta. System (process) and device for filming and projection of cinema film for variable screen. 3,604,791, Cl. 352-40.

Bambas, Irwin J., to DuPage Manufacturing Company. Worm drive hose clamp. 3,604,074, Cl. 24-274.

Ban, Itsuki. Automatic recording level control device for magnetic tape recorder. 3,604,859, Cl. 179-100.2

Ban, Itsuki. Tape cartridge positioning apparatus. 3,604,862, Cl. 179-100.2

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Barreman, Gustav Sigurd, to Forwaltnings Aktiebolaget Acta. Sealed packaging unit with tear string. 3,604,615, Cl. 229-51.

Barrett, Lowell W. Combination key and coin holder. 3,604,233, Cl. 70-459.

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Baumann, Gerhard, to Interhydro A.G. Inset tray for plant containers. 3,604,150, Cl. 47-34.

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Baxter, Jack E., to Baxter Company, The. Pallet and method of manufacture. 3,604,368, Cl. 108-57.

Bayer, Donald R.; and Lachman, Gary R., to Clemar Manufacturing Corporation. Sprinkler systems and variable timing means. 3,604,943, Cl. 307-41.

Bayer, Wolfgang, to Hilti Aktiengesellschaft. Fastening element. 3,604,492, Cl. 151-41.73

Beach, Allan David, to National Research Development Corporation. Infrared optical scanning system comprising a rotatable faceted mirror having inclined facets. 3,604,932, Cl. 250-83.3

Beasley, Charles L., to Deering Milliken Research Corporation. Apparatus for the fluid treatment of fabrics in rope form. 3,604,224, Cl. 68-176.

Beck, August, to Kabel- und Metallwerke Gutehoffrung-shutte Aktiengesellschaft gesellschaft. Construction for cryogenic cables. 3,604,833, Cl. 174-15.

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Becker, Floyd W., to Becker Drilling (Alberta) Ltd. Tong assembly for drill pipes. 3,604,718, Cl. 279-1.

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Boadle, Campbell Dean. Electrical weighing apparatus of the potentiometric balance type. 3,604,524, Cl. 177-70.

Boccalari, Mario; Colombi, Gianfranco; Gabaglio, Mario; Liscia, Aldo; and Siergiej, John M., to Comitato Nazionale per l'Energia Nucleare. Process for effecting metallurgical joints between two different metals and the products obtained thereby. 3,604,102, Cl. 29-474.3

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Boley, Kay B. Wheeled revolvable rider play platform. 3,604,722, Cl. 280-87.01

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Sabaski, Richard E., to Allis-Chalmers Manufacturing Company. Trunnion liner assembly for rotary grinding mill or the like. 3,604,638, Cl. 241-182.

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Shambaugh, Howard G.; and Faulstich, Henry W., to Lovejoy, Inc. Positive drive, variable speed structure. 3,604,282, Cl. 74-230.17

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Smith, Garth R., to ACF Industries, Incorporated. Unloading assist for covered hopper cars. 3,604,578, Cl. 214-500.

Smith, Harvey J. Display storage and dispensing cabinet. 3,604,772, Cl. 312-35.

Smith, Ira Eugene, to RCA Corporation. Method for making an electron-tube grid assembly. 3,604,080, Cl. 29-25.14

Smith, Jack V. Foldable platform assembly for vehicles. 3,604,022, Cl. 5-118.

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Smythe, Craig W., to Dovey Manufacturing Company. Brush anvil. 3,604,302, Cl. 83-659.

Snelling, Christopher; and La Fond, Norman R., to Xerox Corporation. Apparatus for controlling the amount of charge applied to a surface. 3,604,925, Cl. 250-49.5

Snellman, Donald L.; Davis, Ernest D.; and Johnson, Dale R., to Norfin, Inc. Programmed sheet distributing device. 3,604,321, Cl. 93-93.

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